STATE OF NEW HAMPSHIRE
INTER-DEPARTMENT COMMUNICATION

		DATE:	May 23, 2019
FROM:	Andrew O'Sullivan Wetlands Program Manager	**AT (OFFICE):**	Department of Transportation
SUBJECT	Application Amendment Request, RFMI Response, & Mixing Zone Request Lebanon-Hartford, 16148 **(DES#2018-03001)**		Bureau of Environment
TO	Craig Rennie, Inlands Wetlands Supervisor New Hampshire Wetlands Bureau 29 Hazen Drive, P.O. Box 95 Concord, NH 03302-0095		

This letter is in response to the additional information requested in an email to Sarah Large on November 28, 2018 to address: 1) NHDES concerns regarding meeting the mitigation rules and 2) comments received from the Upper Valley River Subcommittee (UVRS) of the Connecticut River Joint Commissions (letter dated October 26, 2018). At the time your request for information was received, design-related discussions involving the Vermont bank cut and proposed scour protection were underway within the project team. These discussions have resulted in design changes that require an application amendment. Therefore, the intent of this submittal is to amend the subject application, as well as to respond to your request for information. This letter also includes a request for a mixing zone to be implemented during the installation of the proposed scour protection.

Application Amendment

An application amendment is requested to account for embedding the proposed A-Jacks scour protection, adding stone across the top of the A-Jacks, and extending the scour protection an additional 5 feet downstream. The extension of the scour protection footprint was determined to be necessary after further analysis of scour potential. Embedding the A-Jacks and adding stone across the top of the A-Jacks is now proposed in order to eliminate the proposed Vermont bank cut and still avoid an increase in base flood elevation. Additional information regarding this change is provided in the enclosed summary of floodway considerations (Attachment #1).

The enclosed wetland impact plans (Attachment #5) and construction sequence (Attachment #4) have been revised to reflect the project as now proposed.

Changing the footprint of the A-Jacks results in an increase in permanent impacts to the channel as follows:

Original permanent impacts:	*Revised permanent impacts:*
Impact Locations E, G = 20,895 square feet 286 linear feet	Impact Locations E, G = 24,049 square feet 296 linear feet
Total permanent impact = 24,636 square feet 444 linear feet	Total permanent impact = 27,790 square feet 454 linear feet
Total project impacts = 119,783 square feet	Total project impacts = 122,937 square feet

The proposed change in impacts is less than a 20% increase.

A payment voucher was originally processed for this application (Voucher #542556) in the amount of $10,000 (NHDOT Fee Cap). Since the NHDOT Fee Cap was previously reached, NHDOT has not provided additional payment for the addition impacts.

The mitigation proposed in the original application package is a single and one time in-lieu fee payment in the amount of $53,746.56 to the ARM fund for the linear feet of impacts to the channel from the new pier footings (impacts D,F,H, & I) and to the bank for drainage work (impact A & N). As discussed at the natural resource agency meetings mitigation would not be required for the scour protection. (See mitigation narrative from original application for additional details). The project team came to the March 20, 2019 Natural Resource Agency Meeting to present the design change. Mitigation was discussed at this meeting and Lori Sommer confirmed that the A-Jacks as proposed could still be considered protection of existing infrastructure since the scour protection would be needed in the same footprint as proposed even if the new pier footings were not proposed.

Proposed Defined Mixing Zone

As part of this application amendment, the Department is proposing a 1,300-foot defined mixing zone to control discharge from the installation of the A-Jacks. The water at the piers can be up to 13 feet deep. Cofferdams are considered the best available technology; however, cofferdams are not proposed since the installation would raise the project costs by approximately $1 million. The Department proposes to install the A-Jacks beds one at a time at each pier to minimize the spatial and temporal impacts from turbid discharges. Direct monitoring of the discharges during the installation of the A-Jacks to meet New Hampshire specific effluent limitations as published in Part 9.1.1.c of the 2017 Construction General Permit (CGP) was considered too hazardous. The Department is proposing a defined mixing zone to ensure compliance with the CGP effluent limitations during the installation of the A-Jacks beds.

The Department proposes the following practices:

1. All proposed monitoring during A-Jacks installation will be completed by a qualified Contractor approved by NHDOT. Daily reports will be kept as part of the SWPPP document.

2. During installation of A-Jacks visual monitoring is proposed due to potential safety concerns associated with obtaining water samples downstream from the bridge and the time of year (winter) when the work may be completed. A background sample will be obtained just upstream from the bridge to provide baseline turbidity information. If conditions associated with access, water velocity, and ice conditions are considered safe, downstream samples will be obtained to calibrate the visual monitoring as described below.

3. Visible turbidity will be allowed during the installation of A-Jacks under the parameters outlined below. Visible turbidity is assumed to be approximately 30 NTUs or greater.

4. Placement: Markers (buoys or similar devices) will be set up in the river at three locations:

    a. Upper Markers - One set of markers will be placed 325 feet downstream from the bridge. Four markers will be placed across the channel, spaced evenly across the channel approximately 80 feet apart. The purpose of the Upper Markers is to evaluate aquatic organism passage within the mixing zone. It is assumed that if turbidity is visible only at a single marker there is adequate aquatic passage throughout the mixing zone.

    b. Middle Marker - A marker will be placed 650 feet downstream from the bridge, at approximately the middle of the mixing zone. It is assumed that 50% of the turbidity will dissipate at this location.

    c. Lower Marker – A marker will be placed 1,300 feet downstream from the bridge. The purpose of the Lower Marker is for reference and to identify the end of the mixing zone.

5. Action:
    a. If turbidity is visible at more than one of the Upper Markers, work will stop temporarily until there is no visible turbid discharge. It is assumed that if turbidity is visible at more than one of the Upper Markers, the turbid discharge is impacting aquatic organism passage.

    b. If turbidity is visible at the Middle Marker, there is potential that turbidity at the end of the mixing zone will be greater than 10 NTUs above background or the CGP effluent limitation has been exceeded, and work will be temporarily stopped until there is no visible turbid discharge seen at the Middle Marker.

6. Work will be allowed to continue only if and once turbidity is not visible at no more than one of the Upper Markers and is not visible at the Middle Marker.

The 1,300-foot mixing zone length was developed based on EPA guidance on developing mixing zones for ambient-induced mixing (located in *Technical Support Document for Water Quality-based Toxics Control*, March 1991), which recommends a flow distance required to achieve complete mixing of 50 to 100 times the depth of water. The proposed mixing zone is based on a water depth of 13 feet. Other metrics can inform the mixing zone length, such as 10 times the bank-full width or half the cross-sectional area of the channel. However, using these metrics on this project would result in a mixing zone that is three-quarters of a mile to over a mile in length. A shorter mixing zone is preferred in order to minimize impacts and facilitate monitoring.

Attachment #6 shows the proposed locations of markers that would establish the mixing zone and water quality monitoring plan as described above.

The duration of construction for the entire project is expected to be approximately 5 years. It is assumed that the A-Jacks installation will take place within the last year of construction; however, final sequencing is up to the Contractor. The proposed mixing zone is intended for only the duration of A-Jacks installation.

Request for Information & Addressing the Upper Valley River Subcommittee's Letter of Concern

This letter and the enclosures constitute a single and complete response to your request for information. As the first item in the letter from the UVRS also discusses mitigation, item #1 below provides a response to both the Subcommittee's concerns as well as NHDES's concerns.

1) **Mitigation:** The mitigation narrative that was included in the application package has been revised to more thoroughly address the NHDES mitigation rules (Chapter 800) – please see Attachment #2. The revised narrative addresses the local projects that have been suggested by the UVRS and Lebanon Conservation Commission. Also attached (Attachment #3) is a timeline of coordination that has occurred throughout the development of this project and applicable correspondence or minutes.

2) **River bank riprap:** This comment is similar to the request from the Lebanon Conservation Commission (Letter to NHDES dated 11/16/2018) to consider conservation matting on the VT bank to better accommodate wildlife passage. The Vermont bank cut has been eliminated from the project. There will be no permanent changes to the existing banks of the river.

3) **Invasive Plants:** It is standard NHDOT procedure to require the Contractor to prepare an Invasive Plant Control Plan prior to the start of construction. This plan must be based on existing NHDOT specifications for invasive plant control, and the plan must be approved by NHDOT before it is implemented. Implementation of the plan is supervised by NHDOT staff throughout construction.

4) **Bridge Stormwater:** Eliminating the open scuppers on the bridge was thoroughly studied. Directing stormwater through a closed drainage system along a bridge is cost prohibitive and maintenance intensive. Also, the project would need to acquire additional right-of-way to increase the size of the infiltration basin to accommodate the additional flow. Water quality was discussed at a number of meetings, including NHDOT Natural Resource Agency Meetings, and no concerns were raised with the site balancing approach that is proposed for stormwater treatment. The overall project will add approximately 1.4 acres of new pavement. The proposed stormwater treatment will treat runoff from 4.86 acres of pavement, which is anticipated to provide an overall net benefit to water quality in the Connecticut River.

5) **Construction Access Road:** The Contractor will not have the rights to conduct any construction activities beyond the existing State right-of-way (ROW). Much of the ROW within the project limits is delineated with existing ROW fence. Orange construction fencing will be installed in areas where there is no existing ROW fence to ensure that no construction activities encroach upon the adjacent conservation area.

6) **Pedestrian Trails:** Access during construction will remain within the existing ROW at the toe of the roadway slopes. All areas used for construction access will be stabilized following construction.

7) **Pier Scour Protection:** Additional details of the proposed A-Jacks are now included in the enclosed wetland impact plans. As discussed above, a decision was made to embed the A-Jacks in lieu of the originally proposed VT bank cut in order to eliminate the increase in base flood elevation. The A-Jacks will not impede river flows or hinder any in-water recreational activities.

8) **NH Bank Section:** Only temporary impacts are proposed along the NH bank for construction access. Since no permanent changes to the bank are proposed, a section view is not provided in the plans. The existing material on the bank will remain and temporary impact areas will be fully stabilized following construction.

9) **Designated Areas:** The UVRS points out that Question 19 of 302.04 (20 Questions) does not address the following designations in place for the Connecticut River: US DOI Designated National Blueway; Silvio O. Conte National Wildlife Refuge; NH Designated River (RSA 483); Two Rivers Conservation Area (City of Lebanon).

   The 410-mile Connecticut River, including its 7.2 million-acre watershed, was designated as the country's first (and only) National Blueway in May 2012. The intent of this designation was to establish a "community-driven conservation and recreation agenda for the 21st century." The proposed project will address existing transportation infrastructure over and adjacent to the river. The project will not impact the river's conservation or recreational values.

   The Silvio O. Conte National Wildlife Refuge is comprised of over 36,000 acres within parts of the four Connecticut River watershed states of New Hampshire, Vermont, Massachusetts, and Connecticut. The refuge "works in partnership with a wide variety of individuals and organizations to provide environmental education, to encourage and support appropriate habitat conservation and management on public and private lands, and to protect habitat." Federally protected lands do not exist in or near the project area. As noted above, the proposed project will address existing transportation infrastructure over and adjacent to the river and will not impact the river's conservation or recreational values. Coordination with the US Fish & Wildlife Service, National Marine Fisheries Service, NH Fish & Game Department, and NH Natural Heritage Bureau took place during project development to assess potential impacts to any species of concern in the area. These agencies had no concerns with the project as proposed.

   The Connecticut River was designated in 2012 as a NH Designated River under NH RSA 483, The Rivers Management and Protection Act. The Rivers Management and Protection Act classifies the entire length of designated rivers using four categories: Natural, Rural, Rural-Community, and Community. State regulated protection measures apply to each of these categories. The segment of the Connecticut River within the project area is classified as Rural-Community. No protection measures associated with this classification restrict the construction of the proposed project. The project will not affect the characteristics contributing to its designation under the Rivers Management and Protection Program. The project proposes to widen existing bridges on the existing Interstate system. The project will not result in changes to any significant statewide or local natural, managed, cultural, or recreational resources within the river corridor. Impacts to the river itself will largely be temporary in nature and will be limited to the area within the immediate vicinity of existing infrastructure. The Mascoma River, which outlets into the Connecticut River approximately 600 feet upstream of Interstate 89, is also a NH Designated River. The river segment in this area is classified as Community. The project area does not extend upstream to the Mascoma River.

   Two Rivers Conservation Area is owned by the City of Lebanon and consists of the land along the Connecticut River to the north and south of Interstate 89. The property abuts the existing State right-of-way (ROW) of the Interstate. The project will be located entirely within the ROW and will not impact the conservation area.

We would be happy to address any additional questions or comments you may have on the enclosed materials.

If and when this amendment request meets with the approval of the Bureau, please send the permit directly to Andrew O'Sullivan, Wetlands Program Manager, Bureau of Environment.

AMO:sel
cc:
BOE Original
City of Lebanon (3 copies via certified mail)
Upper Valley River Subcommittee
Lebanon Conservation Commission
Mike Hicks, Army Corps (via electronic notification)
Mark Kern, EPA (via electronic notification)
Carol Henderson, NHFG (via electronic notification)
Maria Tur, USFWS (via electronic notification)
Dave Trubey, NHDHR (Cultural Review within existing application)

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Lebanon-Hartford, 16148
Summary of floodway considerations

The floodplain of the Connecticut River extends east into New Hampshire and west into Vermont on either side of the river. On the New Hampshire side, the floodplain extends into developed commercial properties both upstream and downstream of the bridge. There is also a regulatory floodway within the river corridor and the areas of proposed work. Hartford and West Lebanon have a history of seasonal and ice-jam related flooding along the Connecticut River.

FEMA requirements state that approval of a letter of map revision must be requested if the Base (1-percent-annual-chance) Flood Elevation (BFE) increases greater than 0.00 foot as a result of encroachment within a floodway, between the pre-project (existing) conditions and the proposed conditions as a result of the proposed project.

Per 44 CFR 60.3 (d), when a regulatory floodway has been identified within a community that participates in the National Flood Insurance Program, the community shall (3) "prohibit encroachments…within the regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge" and (4) the community may permit encroachments within the adopted regulatory floodway that would result in an increase in base flood elevations, provided that the community first applies for a conditional FIRM and floodway revision, fulfills the requirements for such revisions as established under the provisions of § 65.12, and receives the approval of the Federal Insurance Administrator. §65.12 outlines the process for revising flood insurance rate maps to reflect base flood elevations caused by proposed encroachments. Requirements of this process include:

- An evaluation of alternatives that would not result in a base flood elevation increase to demonstrate why these alternatives are not feasible.
- Documentation of legal notice to all impacted property owners, explaining the impact of the proposed action on their property.
- Concurrence of the Chief Executive Officer of each town impacted by the proposed action;
- Certification that no structures are located in areas that would be impacted by the proposed action.

The project as originally proposed included the placement of A-Jacks on the riverbed (no embedment). The A-Jacks, along with the wider piers to accommodate the bridge widening, resulted in an increase in BFE greater than 0.00. Because of the history of flooding in the vicinity of the project and the presence of commercial and residential development along the river, a decision was made early in the project's development that mitigation would be identified to eliminate the increase in BFE rather than initiating the process for revising the flood insurance rate map. Further, with the incorporation of mitigation, it was determined that there are feasible design alternatives that would not result in an increase in BFE. For these reasons, the approval of a map revision was considered unlikely, especially since existing structures could be impacted.

Mitigation for the increase in BFE was originally proposed as benching into both the NH and VT banks. This concept was determined to be undesirable because the NH bank is not conducive to benching and would not provide adequate mitigation. Further, the bank in NH is a jurisdictional area and the benching would be considered a permanent impact that would require compensatory mitigation per NHDES administration rules. The subsequent mitigation design involved benching into only the VT bank along a longer distance (the entire width of the right-of-way). The VT bank is steeper, providing more area to cut

into above ordinary high water. However, after further review of the proposed bank detail, concerns arose with the overall cost and complexity of the bank cut and its proximity to the railroad. Therefore, different opportunities to mitigate the increase in base flood elevation within the project area were explored. It was determined that the impact to the floodway could be eliminated by incorporating two design changes: 1) creating a smoother surface along the top of the A-Jacks by infilling the A-Jacks with clean 3" to 6" stone to mimic the roughness of the natural streambed; and 2) embedding the A-Jacks to place them about 6" lower than the existing river bottom. With these changes, the project would result in zero increase in flood elevation and a bank cut would not be needed.

A Vermont Flood Hazard and River Corridor (FHARC) Permit, administered by the VT Agency of Natural Resources, is required for the proposed project. When a project proposes an increase in BFE, this program requires an approved CLOMR to be included in the application package. Since this project is proposing to incorporate mitigation to eliminate the increase in BFE, a CLOMR was not required for the FHARC permit.

Lebanon, NH - Hartford, VT, 16148
Mitigation Narrative

Revised April 2019

Env-Wt 302.03
Impacts to wetlands in the project area have been avoided. Impacts to the Connecticut River and its banks have been minimized to the extent practicable while still accomplishing the purpose and need of this bridge project.

This project requires compensatory mitigation for permanent impacts to the bank and channel of the Connecticut River that exceed 200 linear feet.

Env-Wt 801.03
On-site mitigation must first be considered to meet permittee-responsible mitigation requirements.

On-site mitigation was suggested by the Upper Valley River Subcommittee (UVRS) of the Connecticut River Joint Commissions in the form of public trail reconstruction and invasive plant control on the Two Rivers Conservation Area located adjacent to the project area.

The Two Rivers Conservation Area was reviewed by Marc Laurin at NHDOT to assess the suitability of the suggested on-site improvements for mitigation. The area has a lot of woody invasive plants, including autumn olive and Oriental bittersweet. Japanese knotweed was not observed along the main trail but there are several patches on the bank in the vicinity of the bridges, which were likely established from upstream sources. Trails are located throughout the property and appear to be maintained by mowing.

Based on the site review, NHDOT concluded that the control of upland invasive plants and restoration of trails was not appropriate mitigation for permanent impacts to the channel and banks of the Connecticut River. Given the size of the parcel, the fragmented landscape, and the constant influx of new invasives from flooding along the two rivers, it is unlikely that invasives could ever be fully eradicated, and the impacts associated with long-term mechanical or chemical controls may not be justified by the relatively small benefit it would provide in this highly fragmented landscape. Trail restoration also did not appear to be suitable mitigation for the proposed impacts given that the trail system was already established and appeared to be currently maintained, and improving the trails would not provide a direct positive benefit to the Connecticut River.

For these reasons, the suggested on-site mitigation project was not considered practicable for the proposed bridge project. After more than five years of project development and coordination with stakeholders, no other on-site mitigation options have been readily apparent. The Two Rivers Conservation Area is existing conservation land located on both sides of the project, protecting the remaining natural buffer located between commercial development to the east and the Connecticut River to the west. No other parcels could be protected in the immediate vicinity of the project.

Lebanon, NH - Hartford, VT, 16148
Mitigation Narrative

Revised April 2019

If on-site mitigation is not practicable, a list of local mitigation projects must be obtained from the municipality in which the project is proposed.

A complete timeline of coordination that has taken place since 2014 is enclosed. While not all of this coordination was directly applicable to seeking mitigation opportunities, especially early in the project's development, there have been a number of opportunities for stakeholders to discuss concerns with proposed impacts and inquire about mitigation.

NHDOT contacted the Upper Valley Land Trust and City of Lebanon in August 2018 specifically to inquire about a list of local mitigation projects. No reply was received from the Upper Valley Land Trust. The City of Lebanon responded with preliminary information about a potential land preservation opportunity, and more details on that opportunity were provided in November. The proposed preservation opportunity is located on the southwest side of Signal Hill adjacent to adjacent City-owned conservation land, approximately 5 miles northeast of the proposed bridge project.

Marc Laurin reviewed the property on December 14, 2018. Due to time constraints and difficulty traversing over the site, resulting from slash remaining from past logging activities on the property, he was able to only review a portion along the south side of the property. He has made reasonable assumptions of the property based on this review. The property is a portion of a 182-acre industrially zoned property owned by James Campion, which was logged after July 2009. Google Earth images show the area identified by the Conservation Commission, estimated at 47 acres, was logged between November 2011 and September 2013, likely in 2012. The parcel is crossed by numerous logging roads containing portions with leftover slash from the logging operation. The access roads and logged areas have started to fill in with pioneering plant species. The logged areas did not seem to have large areas of erosion, though there was a few inches of snow cover that may have masked some areas. The land is a formerly wooded steep hill that now consists of rows of trees separated by the logged areas/access roads. Seeps coming from the hillside are evident, some possibly resulting from the logging operations. A few emergent wetland pockets were noted to have established in depressions fed by these seeps. The area is mostly upland along the steep western hillside of Signal Hill. There were signs of wildlife use (deer tracks, crows) and human use, likely hunters. The parcel does appear that it could function as a wildlife corridor between the existing Signal Hill Conservation property and the Nicole Cormen Memorial Preserve/Rix Ledge, though wildlife would still need to cross the two-lane Etna Road, which is moderately travelled as it provides a connection between Etna and NH 120 in Lebanon and to the numerous industrial buildings along Etna Road.

In summary, though the site has some potential as a conservation area, NHDOT did not consider it to be appropriate mitigation for the proposed impacts to the channel and banks of the Connecticut River located 5 miles from the property. The recent logging operations also make the land a bit less desirable at this time, and the fact that there are no areas of significant wetlands within the property that would be protected by an upland buffer.

Lebanon, NH - Hartford, VT, 16148
Mitigation Narrative

Revised April 2019

If none of the local mitigation projects are appropriate mitigation for the proposed project, the applicant shall provide an explanation and documentation relative to:

(1) Why preservation of aquatic resource buffers as specified in Env-Wt 803.10(b) is not practicable;

As noted above, the NH side of the project is already conservation land that is protected by the City of Lebanon. The local mitigation project proposed by the City of Lebanon does not appear to contain significant streams or wetlands that would be protected by preserving an upland buffer.

(2) Why stream restoration and enhancement activities as specified in Env-Wt 803.10(d) on the property and within the same Hydrologic Unit Code 12 (HUC-12) watershed as the impacts is not practicable; and

The local mitigation project proposed by the City of Lebanon does not contain significant streams that could be restored or enhanced. Stream restoration or enhancement within the HUC-12 watershed was not further investigated. The proposed project will incorporate stormwater treatment that will treat runoff from 4.86 acres of pavement before it reaches the Connecticut River.

(3) Calculation of an in-lieu payment as specified in RSA 482-A:30-a.

Impacts requiring mitigation are as follows:
Permanent impacts to channel from new pier footings = 158 linear feet
Permanent impacts to bank for drainage work = 59 linear feet
Total bank and channel impacts to be mitigated = 217 linear feet

The NHDES Aquatic Resource Mitigation Fund Stream Payment Calculator was utilized to determine the total ARM Fund stream payment of $53,746.56.

As discussed at NHDOT Natural Resource Agency meetings, mitigation would not be required for the scour protection proposed for two piers. There is an existing scour concern at the existing piers and the proposed bridge work is not causing the scour concern. The scour protection would be needed in the same footprint as proposed even if the new pier footings were not proposed. Therefore, the proposed scour protection will be protecting existing infrastructure, which does not require mitigation per Env 302.03(c)(2)c.

LEBANON-HARTFORD, 16148
Coordination with Stakeholders

May 21, 2014 – NHDOT Natural Resource Agency Meeting

June 14, 2014 – NHDOT letter sent to Lebanon Conservation Commission to invite to July 24, 2014 Public Informational Meeting

July 16, 2014 - Lebanon City Council Present Project Overview (*minutes enclosed*)

July 24, 2014 - Public Informational Meeting in Lebanon (*minutes were not prepared*)

November 19, 2014 – NHDOT Natural Resource Agency Meeting

February 17, 2016 – NHDOT Natural Resource Agency Meeting (mitigation discussed)
https://www.nh.gov/dot/org/projectdevelopment/environment/units/project-management/documents/February17Finalminutes.pdf

February 15, 2017– NHDOT Natural Resource Agency Meeting (mitigation discussed)
https://www.nh.gov/dot/org/projectdevelopment/environment/units/project-management/documents/FebruaryMinutes.pdf

August 2, 2018 – NHDOT email to UVLT and City of Lebanon Planning *(email included)*

August 15, 2018 – NHDOT Natural Resource Agency Meeting (mitigation discussed)
https://www.nh.gov/dot/org/projectdevelopment/environment/units/project-management/documents/August152018Minutes-FINAL.pdf

August 22, 2018 – City of Lebanon initial reply to NHDOT regarding local mitigation project *(email included)*

October 11, 2018 – NHDOT field meeting with Connecticut River Joint Commissions, Mascoma River Advisory Committee, and Lebanon Conservation Commission *(emails included)*

November 5, 2018 – City of Lebanon email to NHDOT regarding Conservation Commission meeting and local mitigation project *(email included)*

November ?, 2018 – UVRS permit application reply to NHDES

November 8, 2018 – Conservation Commission Meeting presentation by DOT/MJ
(Conservation Commission meeting minutes included)

- *Conservation Commission's preference is for the mitigation funds to be applied to the local conservation project presented by Board member Mark Goodwin*

November 16, 2018 – Lebanon Conservation Commission permit application reply to DES
(letter included)

- *The Conservation Commission recommends that project mitigation money be applied to Signal Hill and Rix Ledges wildlife corridor preservation.*

OFFICIAL

CITY OF LEBANON
CITY COUNCIL
Minutes, Regular Session, July 16, 2014
City Hall—Council Chambers
7:00 p.m.

MEMBERS PRESENT:	Mayor Georgia Tuttle, Councilors Bruce Bronner, Carol Dustin, Erling Heistad, Karen Liot Hill, Heather Collier Vogel, Stephen Wood
MEMBERS ABSENT:	Assistant Mayor Suzanne Prentiss, Councilor Nicole Cormen
STAFF PRESENT:	City Manager Greg Lewis, City Clerk Sandra Allard, Fire Chief Chris Christopoulos, Public Works Director Michael Lavalla, City Engineer Christina Hall, Airport Manager Rick Dyment

The meeting was called to order at 7:03 p.m. by Mayor Tuttle.

I. PLEDGE OF ALLEGIANCE

Councilor Hill led the Council in the Pledge.

II. PUBLIC FORUM ANNOUNCEMENT BY THE MAYOR

Mayor Tuttle made the announcement.

III. OPEN TO PUBLIC

No members of the public spoke at this time.

IV. RESOLUTIONS: None

V. ACCEPTANCE OF MINUTES: July 2, 2014

Change: Page 2, line 29, replace “Below” with “Welsch”.

Karen Liot Hill moved* to approve the minutes as presented in the July 16, 2014 agenda packet, with the change noted. *Seconded by Bruce Bronner.
****The motion passed 6-0.***

Mr. Lewis said he does not think it is reasonable to gather all of the necessary information in two weeks. He said their mission is to take care of Dulac Street this year. They will have to determine the timeline that would be required and look at a backup plan for Dulac Street. He said the options presented were developed from the walkabouts and community meetings. Councilor Wood said the City gets neighborhood input, but they tell people what the rules are. The City starts by telling people what they cannot have. Mayor Tuttle said that was not how the walkabouts were conducted. She said the City took broad comments.

VIII. OLD BUSINESS

A. Presentation of Second Reading to amend Ordinance #18, Salary Plan, Article III, Bargaining Unit Employees, Lebanon Police Benevolent Association (NEPBA)

Karen Liot Hill moved **that the Lebanon City Council recognizes the second of three presentations to amend Ordinance No. 18, Salary Plan, Article III Bargaining Unit Employees, Lebanon Police Benevolent Association (NEPBA), by replacing the current language with "Employees covered by the terms and conditions of the successor collective bargaining agreement between the City of Lebanon and the Lebanon Police Benevolent Association (NEPBA), as provided in that agreement, and as placed on file in the office of the City Clerk, shall be paid in accordance with the accompanying pay plan for the first pay period of January 2014 to the last pay period of December 2016."** ***Seconded by Stephen Wood.***
****The motion passed 5-0.*** (Councilors Heistad and Wood were not in the room at the time of the vote.)

IX. NEW BUSINESS

A. NHDOT Presentation and Discussion of Bridge Projects: I-89 over the Connecticut River between West Lebanon, NH and White River Junction, VT; and I-89 over Hardy Hill Road, Lebanon.

Joe Adams of NHDOT and Gene McCarthy of McFarland Johnson appeared. Mr. Adams said this project is in the early design stage. Both projects are scheduled to go out to bid in the fall of 2017. The project is federally funded. Mr. McCarthy discussed the importance of the Connecticut River bridge. He said they will do a superstructure replacement, replacing the deck and the steel girders. They will change from separate north and south spans to one large bridge to improve safety and minimize impacts. He showed existing and proposed bridge sections. The bridge will have wider shoulders and auxiliary lanes. They will maintain two-lane traffic in both directions during all construction. He showed possible lane configurations and the pier configuration.

Mr. McCarthy said the taper from the I-91 ramp to I-89 southbound is greater than standard. They are recommending a southbound auxiliary lane between I-91 and Exit 20

of I-89, but a decision about that has not yet been made. He asked if a northbound auxiliary lane would be useful. He reviewed the traffic control strategy. He said at peak times, there will always be two lanes open in both directions. The estimated construction cost is $38 million, and construction is planned for 2018-2019.

Mayor Tuttle noted that presentations will be made at the Kilton Library on July 24 for the Connecticut River bridge project and on July 29 for the Hardy Hill project. She asked if there will be any cost to Lebanon taxpayers. Mr. Adams said there will not. The project is funded by the federal government, as well as New Hampshire and Vermont state funds. Mayor Tuttle asked if this will affect tractor-trailer traffic. Mr. Adams said it will not. Councilor Bronner said adding auxiliary lanes in both directions makes sense. He said it is difficult to break into the right-hand lane on I-89 northbound for those heading onto I-91. Councilors Heistad and Hill agreed. Councilor Hill said the exiting traffic and the through-traffic are moving at different speeds. She suggested road markings to indicate where through-traffic should go.

Councilor Dustin asked how disruption to the river environment will be minimized. Mr. McCarthy said that is a challenge and will be part of the environmental permitting. They will construct temporary trestles to get to the piers.

Ron Kleiner of NHDOT reviewed the Hardy Hill bridge project. He said the bridges were built in 1966, and each bridge is 37 feet wide. The decks are in poor condition. They propose to replace the decks and girders. Construction will be phased, and they will build an additional structure between the existing northbound and southbound spans. They will keep two lanes open in each direction. All work will be done within the right-of-way. Construction is planned for 2018.

Councilor Vogel asked how this will affect traffic on Hardy Hill Road. Mr. Kleiner said hopefully, drivers will not know the work is happening, although they may see scaffolding. There will be no road closures. Councilor Hill asked if the Planning Board will comment on this. She said there are sourcewater issues there, and she expressed the hope that best practices will be used.

B. Request by Execusuite, LLC for eight (8) additional water and sewer units to serve commercial spaces located at 75 Bank Street (former junior high), Lebanon.

(Councilor Hill recused herself at this time.)

Attorney Nick Burke, representing Execusuite, LLC, said this project is nearing completion. They have received approval to create a fitness studio in the former gymnasium, and they have added two additional residential units, a small office, and the SPARK! Community Center. He said Execusuite has an application before the Zoning Board and Planning Board for one additional residential unit. He said Ms. Hall has determined that there is sufficient water and sewer capacity.

Christine J. Perron

From: Urban, Matt <Matt.Urban@dot.nh.gov>
Sent: Thursday, August 02, 2018 8:19 AM
To: Jeanie.mcintyre@uvlt.org; megan.chapman@uvlt.org; mark.goodwin@lebanonnh.gov
Cc: Laurin, Marc; Christine J. Perron
Subject: Lebanon-Hartford 16148

Good Morning,

The New Hampshire Department of Transportation (NHDOT) is in the process of completing engineering studies and environmental review and the wetlands application for the proposed project.

The proposed project consists of the rehabilitation of the Interstate 89 bridges over the Connecticut River between Lebanon, NH and Hartford, VT (Bridges 044/103 and 044/104). The existing superstructure steel will be replaced with new steel and an in-fill will be constructed in the gap between the bridges to provide a single 110'+/- wide bridge deck to facilitate traffic control. The in-fill will require new footings between each of the five pairs of existing piers, four of which are located in the river. The resulting bridge will allow for maintenance of traffic during phased construction. Following construction, the bridge will provide two through lanes in each direction and auxiliary lanes between Exit 20 and I-91 ramps. Three stormwater treatment areas will be constructed to treat runoff. Infiltration basins will be located on the north side of the interstate in both NH and VT, and a treatment swale will be located on the south side of the interstate in NH. Three piers require scour protection. The fourth, westernmost pier in the river is located on bedrock and does not need scour protection. A-Jacks concrete armor units are proposed for the three piers. Mats of these interlocking units would be constructed on land or a barge and then lowered by crane to the river bottom around each pier.

To provide flexibility to the Contractor in locating a temporary construction trestle, a large footprint of temporary impact will be included in the permit application and a work trestle across the full width of the Connecticut River is assumed. Fingers off the main trestle would be needed to access each pier. A temporary causeway/work platform would be needed off each bank of the river to provide a platform from which the trestle would be constructed. A small work platform may also be needed under the bridge between the NH bank and first pier. The trestle and causeways would be in place for the duration of construction, which is expected to be up to four years.

The proposed impacts associated with this project will require mitigation. The total in-lieu fee is expected to be between $53,173.68 and $90,664.80.

A permit application will be submitted to NHDES and the Conservation Commission in early September.

We are reaching out to you to as a proactive measure. The Department would like to request a list from the City, Conservation Commission and/or the Upper Valley Land Trust that identifies your preferred/priority mitigation efforts that the Department may evaluate and consider undertaking if it is determined viable under this project. Please send us a list of your mitigation priorities to consider.

Thank you,
Matt Urban
Chief, Operations Management Section
NHDOT Bureau of Environment
Matt.Urban@dot.nh.gov

Christine J. Perron

From: Urban, Matt <Matt.Urban@dot.nh.gov>
Sent: Thursday, August 23, 2018 7:44 AM
To: Christine J. Perron; Laurin, Marc
Subject: FW: Lebanon-Hartford 16148

Christine,

I just got this email…. But I think I heard that at the last NAT RES meeting we were able to successfully get out of mitigating the temporary impacts…
Where do we stand with what mitigation will look like? I would like to have a better idea before responding to Mark.

Thanks,
Matt

From: Goodwin, Mark [mailto:Mark.Goodwin@lebanonnh.gov]
Sent: Wednesday, August 22, 2018 2:29 PM
To: Urban, Matt
Subject: RE: Lebanon-Hartford 16148

Hello Matt: I might have a project….and looks/feels like one that DES might be really interested in, as well as my local ConCom. And the key variable being I might have a landowner that is interested in moving fast. I assume your meeting with DES took place and things are still moving forward. There is an interest up this way from ULVT and others as to gaining a better understanding of the proposed impacts, primarily whether they are going to be within the ROW, within the river itself, and/or affecting adjacent properties? I suspect all that detail will become available once there is a formal DES application but even something cursory might help, as there is some conservation land in close proximity to the Interstate bridge, and that might add a "layer" of dialogue onto the process. I would be able to tell pretty quickly whether that is the case or not…if there is any graphics/plans available. And no worries if still too premature to be sharing any plans, etc.

-Mark

From: Urban, Matt
Sent: Tuesday, August 07, 2018 10:55 AM
To: Goodwin, Mark
Subject: RE: Lebanon-Hartford 16148

HI Mark,

Yes, our goal for a list would be as soon as possible.
We have a intentions of meeting with DES next week on the 15th to give them another review of the project.
If we knew of some of your priorities going into that meeting it might be helpful but if you can't get a list together by then I understand.

Thanks,
Matt

From: Goodwin, Mark [mailto:Mark.Goodwin@lebanonnh.gov]
Sent: Tuesday, August 7, 2018 10:46 AM
To: Urban, Matt
Subject: RE: Lebanon-Hartford 16148

Hello Matt: Thank you for the in-depth project description. As to looking for mitigation projects, we are pretty familiar with that dance and so I can dust off our list and initiate some conversations over this way to see if we have any candidate projects. This will include discussions internally at City Hall as well as with Jeanie Mcintire @ UVLT.

As to a time frame, I would assume you are desiring "the list" as soon as possible?

Thanks,
Mark

From: Urban, Matt <Matt.Urban@dot.nh.gov>
Sent: Thursday, August 02, 2018 8:19 AM
To: Jeanie.mcintyre@uvlt.org; megan.chapman@uvlt.org; Goodwin, Mark <Mark.Goodwin@lebanonnh.gov>
Cc: Laurin, Marc <Marc.Laurin@dot.nh.gov>; Christine Perron <CPerron@mjinc.com>
Subject: Lebanon-Hartford 16148

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that the Department may evaluate and consider undertaking if it is determined viable under this project. Please send us a list of your mitigation priorities to consider.

Thank you,
Matt Urban
Chief, Operations Management Section
NHDOT Bureau of Environment
Matt.Urban@dot.nh.gov

Christine J. Perron

From: Olivia Uyizeye <ouyizeye@uvlsrpc.org>
Sent: Monday, October 08, 2018 8:46 AM
To: 'James Kennedy'; Christine J. Perron
Subject: RE: Site Visit I-89 Bridge Project

Good morning Jim,

I will inform the Mascoma LAC, as well as the Upper Valley subcommittee. As this is a public meeting, I will post these details on the CRJC website. All to be done today.

All the best,
Olivia

From: James Kennedy [mailto:jimkennedy321@gmail.com]
Sent: Monday, October 08, 2018 7:58 AM
To: CPerron@mjinc.com; Olivia Uyizeye
Subject: Site Visit I-89 Bridge Project

Christine and Olivia,

This is for a site visit to review the plans for the I-89 Bridge over the Connecticut River.

Since this must be a noticed public meeting, let's set it for 10 am, Thursday, October 11, 2018. Olivia - can you get the Mascoma LAC noticed on this meeting?

We will meet at the City of Lebanon Two Rivers Conservation Area Trailhead behind K-Mart Plaza. Go behind the Garden Center, park on the grass/snow removal area (the paved parking is being used by a contractor). We will then go down the trail to the base of the I-89 bridge at the Connecticut River.

Christine - please bring some plans and/or cross sections which clearly show the work and requested impacts. The set I received with the application is not clear and overly complicated. If you can get this on 2 or 3 sheets as a handout for our members, that would be great.

Jim Kennedy
Hanover Representative, Chair
Upper Valley Subcommittee (LAC)
Connecticut River Joint Commissions
603-795-4633

On Mon, Oct 8, 2018 at 7:27 AM Christine J. Perron <CPerron@mjinc.com> wrote:

Jim,

Would Thursday at 10:00 at the project site work for you? DOT and DES would need to weigh in on any discussion of changing proposed mitigation. That can be discussed at our meeting this week.

Thanks,

Christine

From: James Kennedy <jimkennedy321@gmail.com>
Sent: Thursday, October 04, 2018 7:30 AM
To: Christine J. Perron <CPerron@mjinc.com>
Subject: Re: FW: Lebanon-Hartford 16148 (LRMAC)

Christine,

An on-site meeting would be best. We can meet behind K-Mart and take the trail that goes under the bridge. You can see the Vermont side pretty easily from there. I used that trail for a class this spring. I will look at other alternatives.

How about doing some on-site mitigation instead of ARM fund?

Jim Kennedy

On Wed, Oct 3, 2018 at 2:20 PM Christine J. Perron <CPerron@mjinc.com> wrote:

> Thanks Jim. I will check schedules and get back to you. Would you prefer an on-site meeting or should I plan to find a meeting location?
>
> **From:** James Kennedy <jimkennedy321@gmail.com>
> **Sent:** Wednesday, October 03, 2018 2:01 PM
> **To:** Christine J. Perron <CPerron@mjinc.com>
> **Subject:** Re: FW: Lebanon-Hartford 16148 (LRMAC)
>
> How about Thursday, October 11, or Friday Oct 12? 4 pm is usually best for our members, but some of us could be there in the morning or early afternoon.

Jim Kennedy

Hanover Representative, Chair

Upper Valley Subcommittee (LAC)

Connecticut River Joint Commissions

603-795-4633

On Wed, Oct 3, 2018 at 11:32 AM Christine J. Perron <CPerron@mjinc.com> wrote:

> Good morning Jim,
>
> The NHDOT project team for the I-89 bridge project has asked me to coordinate with you to schedule a meeting to discuss the proposed project. Could you send me the dates and times that would work best for you?
>
> Thanks,
> Christine
>
> **Christine Perron, CWS**
>
> Project Manager • Senior Environmental Analyst
>
> McFarland Johnson
>
> 53 Regional Drive • Concord, NH 03301
> OFFICE: 603-225-2978 ext. 128
>
> www.mjinc.com
>
> ---
>
> **From:** Urban, Matt <Matt.Urban@dot.nh.gov>
> **Sent:** Wednesday, October 03, 2018 11:00 AM
> **To:** Adams, Joseph <Joseph.Adams@dot.nh.gov>; Landry, Robert <Robert.Landry@dot.nh.gov>
> **Cc:** Christine J. Perron <CPerron@mjinc.com>; Laurin, Marc <Marc.Laurin@dot.nh.gov>; Crickard, Ronald <Ronald.Crickard@dot.nh.gov>
> **Subject:** Lebanon-Hartford 16148 (LRMAC)

Joe/Bob,

I just received a phone call from Jim Kennedy (Chair of the Connecticut Local River Advisory Committee).

He would like to know if the Department would be willing to meet with him, possibly folks from Vermont, and the Mascoma Local River Advisory committee so that someone from DOT could review the site with them and explain the project and impacts.

He was hoping to be able to meet sometime before the 15th.

I told him that I would let someone more familiar with the project get back to him.

His cell phone is 603-795-4633

His email is jimkennedy321@gmail.com

Let me know if you have questions,

Matt

Christine J. Perron

From: Christine J. Perron
Sent: Thursday, October 11, 2018 3:17 PM
To: Goodwin, Mark; 'James Kennedy'
Cc: Robert Juliano
Subject: Lebanon-Hartford 16148 - October 11 field review
Attachments: Colored Impact Plan_Lebanon-Hartford 16148 Dredge & Fill Application August 2018.pdf; Lebanon-Hartford 16148 project summary.pdf

Thanks again for attending the field review despite the rainy weather. As a follow up to our meeting and to assist you in your review of the application materials, I'm attaching an annotated impact plan as well as a summary of information that is contained within the project's Dredge & Fill Application.

Christine

Christine Perron, CWS
Project Manager • Senior Environmental Analyst
McFarland Johnson
53 Regional Drive • Concord, NH 03301
OFFICE: 603-225-2978 ext. 128
www.mjinc.com

Christine J. Perron

From: Christine J. Perron
Sent: Tuesday, November 06, 2018 11:29 AM
To: Matt Urban; Marc Laurin; Robert Landry
Cc: Juliano, Robert; Joe Adams; 'Large, Sarah'
Subject: Lebanon-Hartford 16148 FW: CT River Wetland Project
Attachments: 2018.11.05-MitigationProject.pdf

Good morning,

I received the email below from Mark Goodwin (City of Lebanon Planning) regarding potential mitigation for the 16148 project (preservation of the parcel shown in the attached map). In a follow up email, Mark added:
I think it could be either an easement or an acquisition and easement. The City owns the neighboring conservation land and so an acquisition could be accomplished as part of a Boundary Line Adjustment. Protecting a portion of that property could be in the $30-70k range, depending upon whether it is closer to 20 acres or more like 35 acres. I believe the Lebanon ConCom would be potentially be interested in making up the difference.

I told Mark that I would pass this along to you for consideration. He also plans to bring this up at Thursday night's meeting.

The permit application at DES proposed a total ARM Fund payment of $53,746.56 for impacts to the river. For reference, the property Mark is interested in protecting is approximately 5 miles northeast of the project.

Christine

Christine Perron, CWS
Project Manager • Senior Environmental Analyst
McFarland Johnson
53 Regional Drive • Concord, NH 03301
OFFICE: 603-225-2978 ext. 128
www.mjinc.com

From: Goodwin, Mark <Mark.Goodwin@lebanonnh.gov>
Sent: Monday, November 05, 2018 5:09 PM
To: Christine J. Perron <CPerron@mjinc.com>
Subject: CT River Wetland Project

Hello Christine: Yes…..we will have a computer and projector on hand. If you give me a copy of the powerpoint file ahead of time….that will like be the easiest option as I can set it up while setting up for the meeting.

On a related note, I have attached a graphic depiction of a potential conservation mitigation project. We continue to discuss the potential with the landowner, and he continues to express interest. It is definitely simply conceptual at this stage of the game, with boundary lines broad brush, as well as acreage and cost estimates.

As previously noted, DES was involved in the conservation protection of the Nicole Cormen Memorial Preserve, including parts of it via the wetland mitigation process. My assumption is that they would likely be most interested in what is being discussed. And depending upon details, it could very well be a "shovel ready" mitigation project.

I will have this graphic available during the meeting and sharing it with the ConCom as we discuss mitigation options. I'll defer to your judgement as to whether to be providing to DES at this point in time, initiating the conversation, etc.

Thanks and shout out if you have any questions. I will be in the field the day of the meeting but should be back around 4pm.

-Mark

From: Christine J. Perron <CPerron@mjinc.com>
Sent: Monday, November 05, 2018 10:38 AM
To: Adams, Tiffany <Tiffany.Adams@lebanonnh.gov>
Subject: RE: 11/8/18 Lebanon Conservation Commission Agenda

Good morning Tiffany,

Can a PowerPoint presentation be accommodated for the Lebanon-Hartford discussion?

Thanks,
Christine

Christine Perron, CWS
Project Manager • Senior Environmental Analyst
McFarland Johnson
53 Regional Drive • Concord, NH 03301
OFFICE: 603-225-2978 ext. 128
www.mjinc.com

From: Adams, Tiffany <Tiffany.Adams@lebanonnh.gov>
Sent: Friday, November 02, 2018 11:03 AM
To: matt.urban@dot.nh.gov; joseph.adams@dot.nh.gov; Christine J. Perron <CPerron@mjinc.com>
Subject: 11/8/18 Lebanon Conservation Commission Agenda

Good morning,

Attached is the agenda for the 11/8/18 Lebanon Conservation Commission, your item is listed as Item 3A. Please let me know if you have questions.

Tiffany Adams
City of Lebanon
Planning & Codes
P: 603-448-1524 ext 1470
F: 603-442-6141

Mark Goodwin, GISP
Lebanon Planning Department
City of Lebanon
51 N. Park Street
Lebanon, NH 03766
603-448-1457 x1471

MARK.GOODWIN@LEBANONNH.GOV ← *new email*

FINAL

LEBANON CONSERVATION COMMISSION
REGULAR MEETING AGENDA
West Meeting Room, City Hall
Thursday, November 8, 2018
7:00 PM

MEMBERS PRESENT:	**Harrison Bourne (Chair), Ernst Oidtmann (Vice Chair), Susan Almy, Albert Miltner, Sarah Riley, Shane Smith (Alt. Council Representative), Suellen Balestra (Alt.),**
MEMBERS ABSENT:	**Don Lacey, Erling Heistad**
STAFF PRESENT:	**Mark Goodwin (GIS Coordinator), Erica Brittner (Asst. City Engineer)**
GUESTS:	**Christine Perron (N.H. DOT Rep.), Bob Juliano (N.H. DOT Bureau of Bridge Design, Project Engineer)**

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1) CALL TO ORDER -Chair Bourne called the meeting to order at 7:03 PM.
Suellen Balestra had voting privileges for this meeting in the absence of Don Lacey.

2) Approval of Minutes: September 13, 2018

A MOTION was made by Ernst Oidtmann to approve the September 13, 2018 Minutes as amended.
The MOTION was seconded by Susan Almy
**** The vote on the MOTION passed (3-0-3). Chair Bourne, Albert Miltner and Suellen Balestra abstained.***

Amendments: Page 1, Line 16, 24, 25 : Change "Lacy" to "Lacey"; Page 1, Line 6: Change: "Goodwin Park" to "Chamber Memorial Reserve."; Page 1, Line27-28: Change "the Policy" to "that a better Norwich Policy"; Page 2, Line 6: Delete "which" ; Page 2. Line 9: Change "Knotweed" to "Knotweed at Ticknor"; Page 2, Line 14: Change glycerin" to glyphosate"; Page 2, Line 18: Change "it is having" to "about"; Page 2, Line 20: Change "parks" to "conservation properties"; Page 2, Line 23: Change "putting up a digital mobile sign to monitor speed and be utilized" to "using the large digital mobile signs currently used to monitor speed to inform drivers about animal crossings". ; Page 2, Line 29: Change "River Cleanup" to Connecticut River Cleanup"; Page 2, Line 29: Delete " He added that Connecticut River Cleanup will be held on the same two days"; Page 2, Line 30: Begin next sentence to read "The Mascoma River Cleanup"; Page 2, Line 31: Change "sponsored by the Mascoma River Advisory Committee" to "sponsored by the Rotary Club of Lebanon and the Mascoma River Advisory Committee"; Page 2, Line 39: Change "Ms. Almy to "Suzanne Church"; Page 2, Line 39: Change "Montshire-Harris Center " to Museum by the Harris Center"; Page 2, Line 43: Delete "is"; Page 2, Line 45: Change " Land Outreach" to "Land Owner Outreach";

3) PERMIT REVIEW

A. <u>STATE OF NHDOT</u> – Review and Comment on NHDES Wetland Standard Dredge and Fill Application - NHDOT Bureau of Bridge Design for the rehabilitation of the I-89 bridges over the Connecticut River between Lebanon, NH and Hartford, VT. Work will entail the replacement of the existing superstructure

steel with new steel and the in-fill of the gap between the bridges to provide a single 110' +/- wide bridge deck. The in-fill will require new footings between each of the five pairs of piers**. (NHDES File #2018-03001) CC#2018-04-Information previously distributed with the October 11, 2018 agenda**

Christine Perron (N.H. DOT Rep.), Bob Juliano (N.H. DOT Bureau of Bridge Design, Project Engineer) made a powerpoint presentation to the commission about the project. After showing an aerial view of the area, Perron provided a brief history and a few characteristics of the bridges. Perron summarized the key components of the project:

PROJECT OVERVIEW

- Superstructure steel replacement;
- In-fill between the bridges to provide a single 110+/- wide bridge deck;
- Approach work;
- New footings between each of the 5 pairs of existing piers;
- Scour protection around 2 piers;
- Benching into VT bank for floodplain mitigation;
- Stormwater Treatment;

PROJECT SCHEDULES

- Advertise the bids; June 2019 (tentative)
- Construction; Late 2019-2023

STORMWATER TREATMENT

- New Hampshire
  - Net increase of approx. 0.9 acres of impervious area
  - Two BMPs proposed: infiltration basin and treatment swale
  - Treatment of approx. 2.82 acres of impervious area
- Vermont
  - Net increase of approx. 0.5 acres of impervious area
  - One BMP proposed: infiltration basin
  - Treatment of approx. 2.04 acres of impervious area

- Existing Pier Configuration
- Proposed Pier Configuration

Perron showed a hydraulic modelling map (increase in base flood elevation) – VT Bank

- Scour Protection
- Construction Access (Information about trestles)
- Proposed Impacts – Summary

	Sq. Feet	LF
Permanent Impact		
- Wetland	0	
- Channel (new footings)	3,117	158
- Channel (scour protection	20,895	286
- Bank (drainage)	623	59
Totals	**24,635**	**503**

	Temporary Impacts		
-	Channel (causeways)	6,710	213
-	Bank (causeways)	1,148	131
-	Bank/Chan. (Trestle/Cons)	87,289	221
	Totals	**95,147**	**565**

- Other Resource Consideration
  - Essential Fish Habitat
  - Dwarf wedgemussel
  - Northern long-eared bat
  - State-listed plants and wildlife
  - Historic resources

- Permitting
  - NHDES Dredge &Fill Permit
  - Section 404/: Army Corps VT and NH General Permits
  - NHDES Shoreland Permit
  - VT River Corridor Permit
  - VT Stormwater Permits

Perron showed a wetlands maps and photos from the Vt. and NH Banks. She also showed an Impact Plan and slides denoting and explaining Construction Access (Temporary Work Trestle).

Throughout and following the presentation, Perron and Juliano welcomed comments and questions from members of the Conservation Commission.

Mr. Goodwin discussed items for mitigation while presenting slides and conceptual maps. Items included:

- $54,000 (going into the ARC Fund)
- Conversations with DOT and DES (land vs. a check)
- Etna Road – Signal Hill area and additional properties – acreage (selling or easement – securing the corridor)
- Wildlife/Conservation Value (DES)
- Permits
- Access Road (Zoning)

CONDITIONS AND MOTIONS (Project and Conditions – Pursuit of the Property)

Susan Almy made a motion recommending the NHDES Wetland Standard Dredge and Fill Application - NHDOT Bureau of Bridge Design for the rehabilitation of the I-89 bridges over the Connecticut River between Lebanon, NH and Hartford, VT. Work will entail the replacement of the existing superstructure steel with new steel and the in-fill of the gap between the bridges to provide a single 110' +/- wide bridge deck. The in-fill will require new footings between each of the five pairs of piers. (NHDES File #2018-03001) CC#2018-04- The recommendation was made with the following conditions: The motioned was seconded by Ernst Oidtmann. * The vote on the MOTION passed (6-0).

1. Appropriate siltation/erosion/turbidity controls shall be in place prior to construction, shall be maintained during construction, and remain in place until the area is stabilized. Silt fences must be removed once the area is stabilized.

2. There should be no introduction or spread of invasive species.

3. The Contractor shall have appropriate oil spill kits on site and readily accessible at all times during construction and each operator shall be trained in its use.

4. All refuelling of equipment shall occur outside of surface waters or wetlands during construction.

5. Within three days of the last activity in an area, all exposed soil areas, where construction activities are complete, shall be stabilized by seeding and mulching during the growing season, or if not within the growing season, by mulching with tack on slopes steeper than 3:1 or netting/matting and pinning on slopes steeper than 2:1

6. All areas cleared of vegetation to be revegetated as quickly as possible

7. Dredged material shall be placed outside of the jurisdictional wetland area.

8. Conservation Mix shall be used in the event of reseeding & straw as opposed to hay for proposed mulching**.**

9. The Conservation Commission preference is for the mitigation funds to be applied to the conservation project as presented, as opposed to a deposit in the DES ARM fund.

10. When the western bank is re-shelved with rip-rap, the Commission would like to see conservation matting suitable to allow larger wildlife passage placed over the rip-rap.

B. CITY OF LEBANON/MASCOMA LAKE FARM LLC- Review and comment on NHDES Wetland Expedited Review (minimum impact only) application to make stream bank stabilization along approximately 250 feet of roadway adjacent to a small stream, for lands located at approximately 192-196 Rudsboro Road, Lebanon. CC#2018-05

Assistant City Engineer Erica Brittner presented the project.

- History of the project
- Granite Block just above the water line to prevent the scouring and washing away the banks (stabilize the banks)
- Replace the guardrail

A MOTION was made by Ernst Oidmann to authorize Chair Bourne to sign the expedited wetland permit (Item 3B.) Seconded by Albert Miltner.
**** The vote on the MOTION passed (4-2). Susan Almy and Sarah Riley opposed.***

DARTMOUTH HITCHCOCK MEDICAL CENTER - Review and comment on NHDES Wetland Expedited Review (minimum impact only) application to replace a wooden boardwalk with a paved path with culverts crossing the waterway on lands located at1 Medical Center Dr. Lebanon, Tax Map 10 Lot 8 NH CC#2018-06. **WITHDRAWN**

4) STUDY ITEMS:

A. Review and Comment to City Council on Proposed Zoning Map and Text Amendments

- Section 306.3 – Increase Maximum Permitted Height in the CBD.
- Sections 311.3, 311A3, and 311B.3 – Eliminate Enhanced Setback for State Highways.

PURD AMENDMENTS:

Sections 311.2 311A.2. 500 .B and 501,2.B – Add PURD as a permitted Use in the R-0 and R-0-1 Districts.

Section 501.2.C – Clarify Uses Permitted in a PURD

- Section 410.7 Update Riverbank Protection District Special Provisions
- Section 608.4.A.1a – Adjust Maximum Permitted Sign Area
- Section 612.2.C & Appendix A – Adjust Accessory Solar Energy System Requirement
- Appendix A – Revise Definition of Family
- 388 N. Main Street and 386 N. Main Street: RL-3 to R -3
- 3Seminary Hill and 5 South Main Street : R-2 to CBD

A MOTION was made by Susan Almy that the Conservation Commission has no objections to the proposed Zoning Map and Text Amendments because there is no adverse impact on conservation. Seconded by Albert Miltner.
**** The vote on the MOTION passed (6-0)***

5. COMMITTEE REPORTS:

A. Conservation Lands Monitors

- Report on NH Association of Conservation Commission Annual Meeting, Nov. 3, 2018, Pembroke, NH
- Permanent Concrete Pavers
- Accessible Maps
- Culvert Issues
- Digital Mobile Signs
- Rock Walls – Wildlife Crossing

A MOTION was made by Suellen Balestra to adjourn the meeting at 9:28 PM.
Seconded by Ernst Oidtmann
**** The vote on the MOTION passed (6-0).***

Respectfully Submitted,

Stuart Kaufman
Recording Secretary

CITY OF LEBANON~PLANNING & DEVELOPMENT OFFICE

November 16, 2018

State of New Hampshire
DES Wetlands Bureau
Post Office Box 95
Concord, NH 03302-0095

Re: STATE OF NHDOT- NHDES Wetland Standard Dredge and Fill Application-NHDOT Bureau of Bridge Design for the rehabilitation of the 1-89 bridges over the Connecticut River between Lebanon, NH and Hartford, VT. Work will entail the replacement of the existing superstructure steel with new steel and the in-fill of the gap between the bridges to provide a single 110'+/- wide bridge deck. The in-fill will require new footings between each of the five pairs of piers. NHDES File # 2018-03001

Dear Sir/Madame:

On November 8, 2018, the Lebanon Conservation Commission reviewed the above referenced application. After a presentation and discussion the Commission rendered the following motion:

> ***A MOTION made by Susan Almy that the Lebanon Conservation Commission recommends the NHDES Wetland Standard Dredge and Fill Application - NHDOT Bureau of Bridge Design for the rehabilitation of the I-89 bridges over the Connecticut River between Lebanon, NH and Hartford, VT. Work will entail the replacement of the existing superstructure steel with new steel and the in-fill of the gap between the bridges to provide a single 110' +/- wide bridge deck. The in-fill will require new footings between each of the five pairs of piers. (NHDES File #2018-03001) CC#2018-04***

1. Appropriate siltation/erosion/turbidity controls shall be in place prior to construction, shall be maintained during construction, and remain in place until the area is stabilized. Silt fences must be removed once the area is stabilized.

2. There should be no introduction or spread of invasive species.

51 North Park Street ~ Lebanon, NH ~ 03766
Phone: (603)448-1457 or (603)448-1524; Fax 442-6141 WWW.Lebanonnh.gov

3. The Contractor shall have appropriate oil spill kits on site and readily accessible at all times during construction and each operator shall be trained in its use.

4. All refuelling of equipment shall occur outside of surface waters or wetlands during construction.

5. Within three days of the last activity in an area, all exposed soil areas, where construction activities are complete, shall be stabilized by seeding and mulching during the growing season, or if not within the growing season, by mulching with tack on slopes steeper than 3:1 or netting/matting and pinning on slopes steeper than 2:1

6. All areas cleared of vegetation to be revegetated as quickly as possible

7. Dredged material shall be placed outside of the jurisdictional wetland area.

8. Conservation Mix shall be used in the event of reseeding & straw as opposed to hay for proposed mulching**.**

9. The Conservation Commission would like to see the mitigation money applied to the southwest side of Signal Hill and Rix Ledges wildlife corridor to preserve the project.

10. When the western bank is re-shelved with rip-rap, the Commission would like to see conservation matting suitable to allow larger wildlife passage place over the rip-rap.

If you have any questions, please contact the Planning Office at 448-1457.

Sincerely,

Crystal Adams

Administrative Assistant

cc: Joseph Adams, NHDOT (via email)
Matt Urban, NHDOT (via email)
Christine Perron, McFarland Johnson (via email)

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NH Department of Transportation
Lebanon-Hartford, 16148

Revised Construction Sequence

Season 1 – Construct Temporary work trestles, median roadway widening, and abutment infills.

- Install perimeter controls around trestle bulkhead areas and Pier 1 work area.
- Install trestle bulkheads and Pier 1 work area.
- Install trestle
- Construct Abutment Infills
- Install perimeter controls along toe of slope in New Hampshire
- Install EPSC measures (i.e Dandy Bags) at catch basins in median.
- Construct temporary sediment basins between toe of slope and right-of-way line along both barrels of the Interstate, presumably in the location of the permanent treatment swale and infiltration basin, while leave sufficient room for contractor access to the work area.
- Construct roadway widening in the median.

Season 2 – Construct bridge infill including piers, structural steel, and deck. Once completed, shift southbound traffic to the newly completed middle of bridge.

- Maintain all EPSC measures placed in Season 1
- Install perimeter controls around Piers, 2, 3, and 4 work zones.
- Construct pier infills.
- Remove perimeter controls around Piers, 2, 3, and 4 work zones.
- Place structural steel for new deck area.
- Construct new deck area.
- Once new deck area is completed, shift southbound traffic to newly completed middle of bridge.

Season 3 – Reconstruct southbound bridge including abutment and pier modifications, structural steel replacement, and deck. Once completed, reconstruct roadway approaches to shift southbound traffic onto the new southbound portion of the bridge and shift northbound traffic to the middle of the bridge.

- Maintain all EPSC measures placed in Season 1.
- Remove existing deck and structural steel for southbound bridge.
- Place structural steel for new southbound bridge.
- Construct new southbound bridge deck area.
- Construct roadway approaches to southbound bridge.
- Once new deck area is completed, shift southbound traffic to new southbound bridge.
- Reconstruct median area to allow northbound traffic to be placed on middle of the bridge.
- Shift northbound traffic to newly completed middle of bridge.

Season 4 - Reconstruct northbound bridge including abutment and pier modifications, structural steel replacement, and deck. Once completed, reconstruct roadway approaches to shift northbound traffic onto the new northbound portion of the bridge. Reconfigure the center of the bridge and install median barrier. Reconstruct the roadway approach to the final lane configuration.

- Maintain all EPSC measures placed in Season 1.
- Remove existing deck and structural steel for northbound bridge.
- Place structural steel for new northbound bridge.
- Construct new northbound bridge deck area.
- Construct roadway approaches to northbound bridge.
- Once new deck area is completed, shift northbound traffic to new northbound bridge.
- Reconstruct median area for final condition.

Season 5 – Remove the temporary work trestles.

- Finalize median reconstruction for final condition.
- Place traffic in final configuration.
- Begin removing the temporary work trestle.
- Place A-Jacks scour countermeasures at Piers 2 and 3.
- Remove remaining temporary work trestle.
- Remove work trestle bulkheads and Pier 1 work platform.
- Remove perimeter controls around work trestle bulkheads and Pier 1 work platform.
- Construct vegetated treatment swale and infiltration basin.

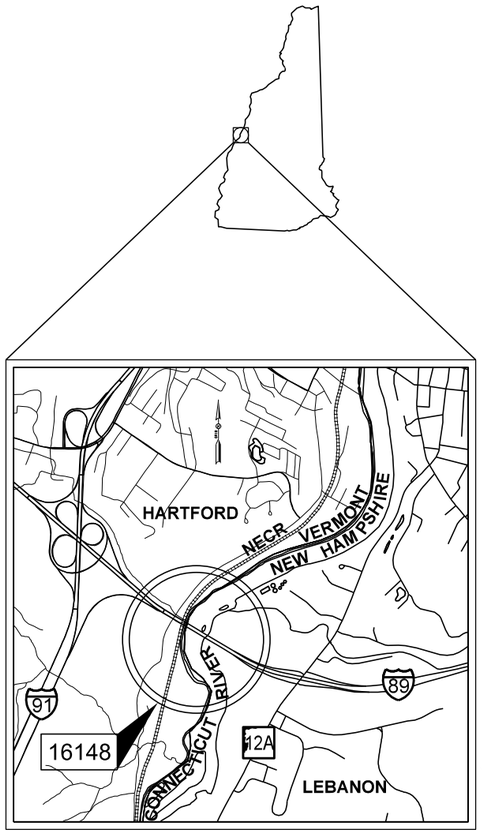
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

WETLAND PLANS
FEDERAL AID PROJECT
OF PROPOSED BRIDGE REHABILITATION
BRIDGE NO. 044/103 AND BRIDGE NO. 044/104
ON INTERSTATE 89
A001(154)
NH PROJECT NO.16148

DESIGN DATA

INTERSTATE 89

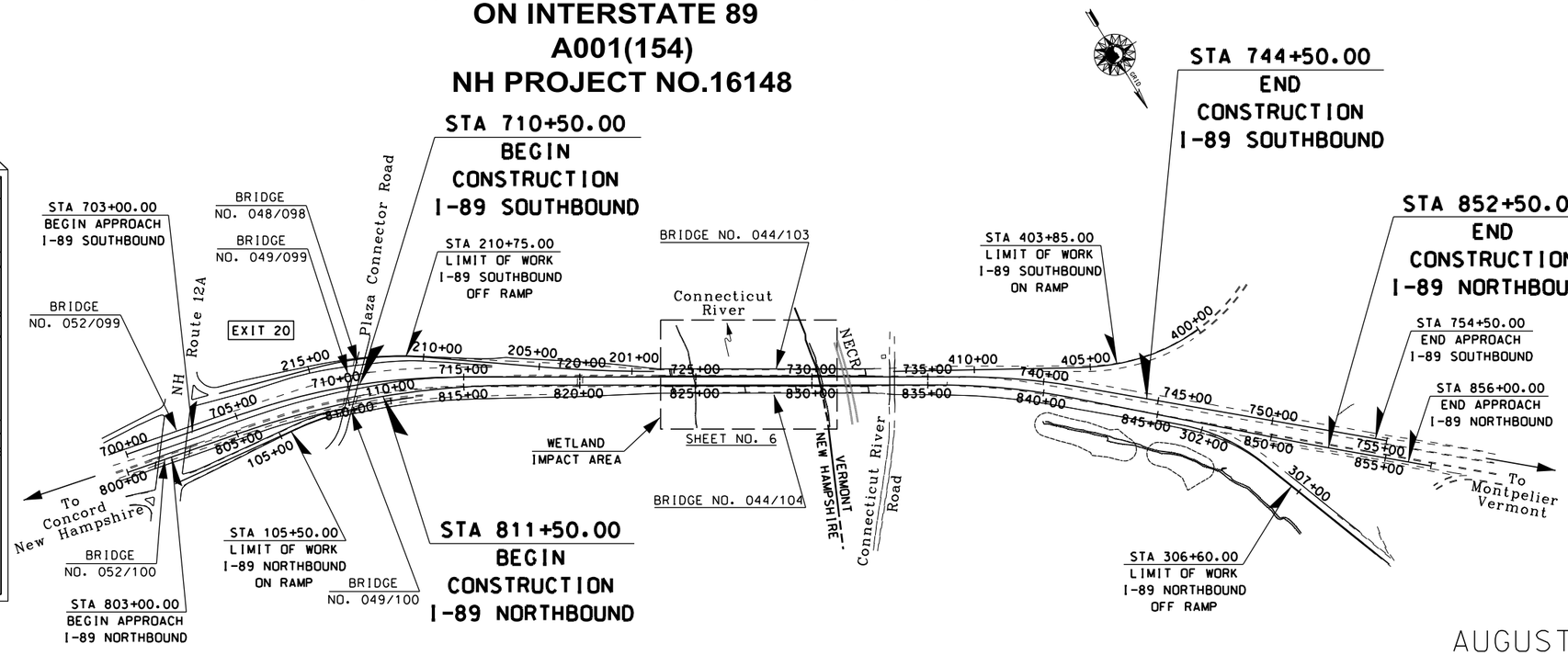
AVERAGE DAILY TRAFFIC	2019	39,900 (NB & SB)
AVERAGE DAILY TRAFFIC	2039	43,600 (NB & SB)
PERCENT OF TRUCKS		10.2%
DESIGN SPEED		70 MPH - NH (NB)
		65 MPH - NH (SB)
		70 MPH - VT (NB & SB)
LENGTH OF PROJECT		0.78 MILES (NB)
		0.64 MILES (SB)



LOCATION MAP

1 1/2 0 1 mi.

GRAPHIC SCALE



AUGUST 2018
REVISED APRIL 2019

CITY OF LEBANON, NEW HAMPSHIRE
COUNTY OF GRAFTON
AND
TOWN OF HARTFORD, VERMONT
COUNTY OF WINDSOR

SCALE = 1" = 300'

FOR CONSTRUCTION AND ALIGNMENT DETAILS - SEE THE CONSTRUCTION PLANS

DRAWN BY MAL DATE 04/2016
CHECKED BY BRC DATE 08/2018

WETLAND PLANS PREPARED BY

McFarland Johnson

McFARLAND JOHNSON
CONCORD, N.H.

DELINEATION : September 2014

STATE OF NEW HAMPSHIRE
JED S. MERROW
No. 177
CERTIFIED WETLAND SCIENTIST

NHDOT THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR APPROVAL:

DIRECTOR OF PROJECT DEVELOPMENT — DATE

APPROVED:

ASSISTANT COMMISSIONER AND CHIEF ENGINEER — DATE

FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
A001(154)	16148	1	14

GENERAL

EDGE OF PAVEMENT — PROPOSED ROADWAY
TRAVELED WAY — existing roadway — (pavement removed outside slope lines)

DRIVEWAYS — (label surface type)

BUILDINGS — (building to be removed)
(label house or type of building)

FOUNDATION — (label type)

LEACH FIELD — leach field

BRIDGE CROSSINGS — STREAM — OVERPASS

STEPS AND WALK — (label type)

INTERMITTENT WATER COURSE

SHORE LINE — river/stream — pond — (label name of water body)

POTENTIAL WET AREA SYMBOL

BRUSH OR WOODS LINE

TREES (PLANS) — (deciduous) (coniferous) (stump)

TREE OR STUMP (CROSS-SECTIONS) — (show station, circumference in feet & type)

HEDGE — (label type)

MONITORING WELL — mon W

WELL — W

FLAG POLE — fp

ORIGINAL GROUND (TYPICALS)

ROCK OUTCROP

ROCK LINE (TYPICALS & SECTIONS ONLY)

GUARDRAIL (label type) — existing — PROPOSED — bgr — cgr

JERSEY BARRIER

CURB (LABEL TYPE)

STONE WALL

RETAINING WALL (LABEL TYPE) — (points toward retained ground)

FENCE (LABEL TYPE)

SIGNS — (single post) — (double post)

GAS PUMP — gp

FUEL TANK (ABOVE GROUND) — ft (label size & type)

STORAGE TANK FILLER CAP — fc

SEPTIC TANK — S

GRAVE — gr

MAILBOX — mb

VENT PIPE — vp

SATELLITE DISH ANTENNA — da

PHONE — ph

GROUND LIGHT/LAMP POST — gl — lp

BORING LOCATION — B

TEST PIT — TP

INTERSTATE NUMBERED HIGHWAY — 293

UNITED STATES NUMBERED HIGHWAY — 3

STATE NUMBERED HIGHWAY — 102

SHORELAND - WETLAND

WETLAND DESIGNATION AND TYPE — 2 PUB2E

DELINEATED WETLAND — DW
ORDINARY HIGH WATER — OHW
TOP OF BANK — TOB
TOP OF BANK & ORDINARY HIGH WATER — TOBOHW
NORMAL HIGH WATER — NHW
WIDTH AT BANK FULL — WBF
PRIME WETLAND — PWET
PRIME WETLAND 100' BUFFER — PWET100
NON-JURISDICTIONAL DRAINAGE AREA — NJDA
COWARDIN DISTINCTION LINE — CDL
TIDAL BUFFER ZONE — TBZ
DEVELOPED TIDAL BUFFER ZONE — DTBZ
HIGHEST OBSERVABLE TIDE LINE — HOTL
MEAN HIGH WATER — MHW
MEAN LOW WATER — MLW
VERNAL POOL — VP
SPECIAL AQUATIC SITE — SAS
REFERENCE LINE — REF
WATER FRONT BUFFER — WB50
NATURAL WOODLAND BUFFER — NWB150
PROTECTED SHORELAND — PS250
INVASIVE SPECIES LABEL — I.S. I — I.S. II
INVASIVE SPECIES — INV

FLOODPLAIN / FLOODWAY

500 YEAR FLOODPLAIN BOUNDARY — FP500
100 YEAR FLOODPLAIN BOUNDARY — FP100
FLOODWAY — FW

ENGINEERING

CONSTRUCTION BASELINE — 30 31 32

PC, PT, POT (ON CONST BASELINE)

PI (IN CONSTRUCTION BASELINES)

INTERSECTION OR EQUATION OF TWO LINES

ORIGINAL GROUND LINE (PROFILES AND CROSS-SECTIONS)

PROFILE GRADE LINE (PROFILES AND CROSS-SECTIONS)

CLEARING LINE — SLOPE LINE

SLOPE LINE

SLOPE LINE (FILL)

SLOPE LINE (CUT)

PROFILES AND CROSS SECTIONS:
ORIGINAL GROUND ELEVATION (LEFT) — 72.5
FINISHED GRADE ELEVATION (RIGHT) — 79.14

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11-21-2014	10430symb1_2	16148	2	14

DRAINAGE

MANHOLE
CATCH BASIN (cb)
DROP INLET (di)
(existing) (PROPOSED)

DRAINAGE PIPE (existing) (label size & type)
DRAINAGE PIPE (PROPOSED)
UNDERDRAIN (existing) W/ FLUSHING BASIN (fb) (label size & type)
UNDERDRAIN (PROPOSED) W/ FLUSHING BASIN
show direction of flow
HEADER (existing & PROPOSED) (with stone outlet protection)
END SECTION (existing & PROPOSED) METAL or PLASTIC, RCP
OPEN DITCH (PROPOSED)
EROSION CONTROL/ STONE SLOPE PROTECTION

BOUNDARIES / RIGHT-OF-WAY

RIGHT-OF-WAY LINE (label type)
RR RIGHT-OF-WAY LINE
PROPERTY LINE
PROPERTY LINE (COMMON OWNER)
TOWN LINE — BOW / CONCORD
COUNTY LINE — COOS / GRAFTON
STATE LINE — MAINE / NEW HAMPSHIRE
NATIONAL FOREST
CONSERVATION LAND
BENCH MARK / SURVEY DISK
BOUND (bnd) (PROPOSED)
STATE LINE/ TOWN LINE MONUMENT (S/L) (T/L)
NHDOT PROJECT MARKER
IRON PIPE OR PIN (ip)
DRILL HOLE IN ROCK (dh)
TAX MAP AND LOT NUMBER (156 / 14) 1642/341 6.80 Ac.±
PROPERTY PARCEL NUMBER (12)
HISTORIC PROPERTY (H)

UTILITIES

existing PROPOSED

TELEPHONE POLE
POWER POLE
JOINT OCCUPANCY
MISCELLANEOUS/UNKNOWN POLE
GUY POLE OR PUSH BRACE
(plot point at face not center of symbol)
LIGHT POLE
LIGHT ON POWER POLE
LIGHT ON JOINT POLE

POLE STATUS:
REMOVE, LEAVE, PROPOSED, OR TEMPORARY
AS APPLICABLE e.g.:
R L P+04 25.0' T+04 25.0'

RAILROAD (label ownership)
RAILROAD SIGN
RAILROAD SIGNAL
UTILITY JUNCTION BOX (jb) (JB)
OVERHEAD WIRE (OW) (label type)

UNDERGROUND UTILITIES
WATER (on existing lines label size, type and note if abandoned) (W) (PW)
SEWER (S) (PS)
TELEPHONE (T) (PT)
ELECTRIC (E) (PE)
GAS (G) (PG)
LIGHTING (L) (PL)
INTELLIGENT TRANSPORTATION SYSTEM (ITS) (PITS)
FIBER OPTIC (FO) (PFO)
WATER SHUT OFF (WSO) (WS)
GAS SHUT OFF (GSO) (GS)
HYDRANT (HYD)

MANHOLES
SEWER (S) (MHS)
TELEPHONE (T) (MHT)
ELECTRICAL (E) (MHE)
GAS (G) (MHG)
UNKNOWN (U)

TRAFFIC SIGNALS / ITS

existing PROPOSED

MAST ARM (existing) 30' MA (NOTE ANGLE FROM ℄)
OPTICOM RECEIVER
OPTICOM STROBE
TRAFFIC SIGNAL
PEDESTAL WITH PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON UNIT
SIGNAL CONDUIT (C) (PC)
CONTROLLER CABINET (cc) (CC)
METER PEDESTAL (mp) (MP)
PULL BOX (pb) (PB)
LOOP DETECTOR (QUADRUPOLE) (label size)
LOOP DETECTOR (RECTANGULAR) (label size)
CAMERA POLE (CCTV)
FIBER OPTIC DELINEATOR (fod) (FOD)
FIBER OPTIC SPLICE VAULT (SVF)
ITS EQUIPMENT CABINET (its) (ITS)
VARIABLE SPEED LIMIT SIGN
DYNAMIC MESSAGE SIGN
ROAD AND WEATHER INFO SYSTEM

CONSTRUCTION NOTES

CURB MARK NUMBER - BITUMINOUS	B-1
CURB MARK NUMBER - GRANITE	G-1
CLEARING AND GRUBBING AREA	A
DRAINAGE NOTE	1
EROSION CONTROL NOTE	A
FENCING NOTE	A
GUARDRAIL NOTE	1
ITS NOTE	1
LIGHTING NOTE	A
TRAFFIC SIGNAL NOTE	1

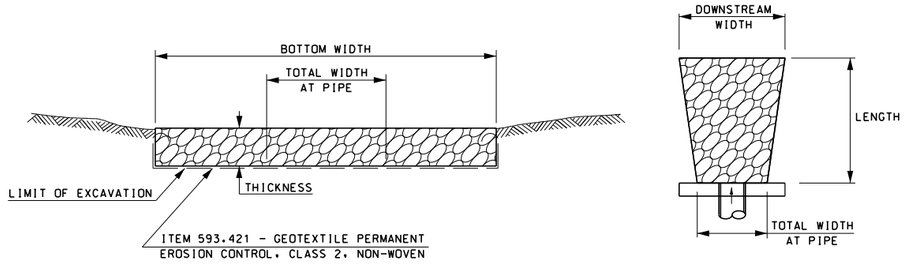
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN
STANDARD SYMBOLS

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
9-1-2016	10430symb1_2	16148	3	14

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

STONE FILL PAD



LOCATION	LENGTH	TOTAL WIDTH AT PIPE	DOWNSTREAM WIDTH	STONE CLASS	THICKNESS
STA 824+87.0, RT 161.7'	12'	6'	14.8'	C	1.0

WETLAND IMPACT SUMMARY - NEW HAMPSHIRE

WETLAND NUMBER	WETLAND CLASS-IFICATION	LOCATION	AREA IMPACTS						LINEAR STREAM IMPACTS FOR MITIGATION			COMMENTS
			PERMANENT				TEMPORARY		PERMANENT			
			N.H.W.B. (NON-WETLAND)		N.H.W.B. & A.C.O.E. (WETLAND)				BANK LEFT	BANK RIGHT	CHANNEL	
			SF	LF	SF	LF	SF	LF	LF	LF	LF	
2	BANK	A	579	45					45			OUTLET OF VEGETATED TREATMENT SWALE
2	BANK	B					145	41				TEMPORARY BULKHEAD (BANK IMPACT)
3	R2UBH	C					1309	41			41	TEMPORARY BULKHEAD (CHANNEL IMPACT)
3	R2UBH	D			733	43					43	NEW PIER FOOTING
3	R2UBH	**E**			**11580**	**148**						**A - JACKS**
3	R2UBH	F			705	39					39	NEW PIER FOOTING
3	R2UBH	**G**			**12469**	**148**						**A - JACKS**
3	R2UBH	H			939	39					39	NEW PIER FOOTING
3	R2UBH	I			741	37					37	NEW PIER FOOTING
3	R2UBH	J					1598	42			42	TEMPORARY BULKHEAD (CHANNEL IMPACT)
2	BANK	K					532	50				TEMPORARY BULKHEAD (BANK IMPACT)
3	R2UBH	L					1217	50			50	TEMPORARY BULKHEAD (CHANNEL IMPACT)
2	BANK	M					471	40				TEMPORARY BULKHEAD (BANK IMPACT)
2	BANK	N	44	14					14			PIPE OUTLET / STONE APRON
3	R2UBH	O					1422	40			40	TEMPORARY BULKHEAD (CHANNEL IMPACT)
3	R2UBH	P					87289	221				TEMPORARY IMPACTS FOR CONSTRUCTION ACCESS*
3	R2UBH	Q					1164	40			40	TEMPORARY BULKHEAD (CHANNEL IMPACT)
		TOTAL	623	59	**27.167**	**454**	95,147	565	59		371	

* ACTUAL IMPACTS WILL BE LIMITED TO TRESTLE PILES (APPROX. 600 SF)

** IMPACTS SHOWN IN BOLD TEXT HAVE BEEN REVISED

NEW HAMPSHIRE IMPACTS

PERMANENT IMPACTS:	**27,790 SF**
TEMPORARY IMPACTS:	95,147 SF
TOTAL IMPACTS:	**122,937 SF**

VERMONT IMPACTS

PERMANENT IMPACTS:	0 SF
TEMPORARY CHANNEL:	385 SF

Cowardin Classification
R2UBH (Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded)

		DATE
SDR PROCESSED	NHDOT	04-2015
NEW DESIGN	MJ	04-2016
SHEET CHECKED	BRC	02-2018
AS BUILT DETAILS		DATE

McFarland Johnson

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

WETLAND IMPACT SUMMARY SHEET

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16148wetsum	16148	4	14

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	DESCRIPTION

SDR PROCESSED NHDOT DATE 04-2015
NEW DESIGN MJ DATE 04-2016
SHEET CHECKED BRC DATE 02-2018

AS BUILT DETAILS DATE

STA 710+50.00
I-89 SB
BEGIN
CONSTRUCTION

STA. 210+75.00
I-89 SB OFF-RAMP
LIMIT OF WORK

PLAZA CONNECTOR ROAD

ROTHENBERG, DANIEL E.

I-89 SB Off-Ramp

I-89 SB

I-89 NB

I-89 NB ON-Ramp

EXISTING LAROW

SLOPE LINE

I-89 NB STA 812+80.00, RT 24.00' =
I-89 NB ON-RAMP STA 111+00.00

CLEAR TO
RIGHT-OF-WAY LINE

STA 811+50.00
I-89 NB
BEGIN
CONSTRUCTION

STA. 105+50.00
I-89 NB ON-RAMP
LIMIT OF WORK

WINDALIER WEST
LEBANON, LLC

CITY OF
LEBANON

MATCHLINE STA 719+50 SB
SEE WETLAND PLAN 03

MATCHLINE STA 819+50 NB
SEE WETLAND PLAN 03

LEGEND

TYPE OF WETLAND IMPACT	SHADING/ HATCHING
NEW HAMPSHIRE WETLANDS BUREAU (PERMANENT NON-WETLAND)	
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)	
TEMPORARY IMPACTS	
TEMPORARY IMPACTS IN VERMONT	

WETLAND DESIGNATION NUMBER

WETLAND IMPACT LOCATION

WETLAND MITIGATION AREA

MITIGATION

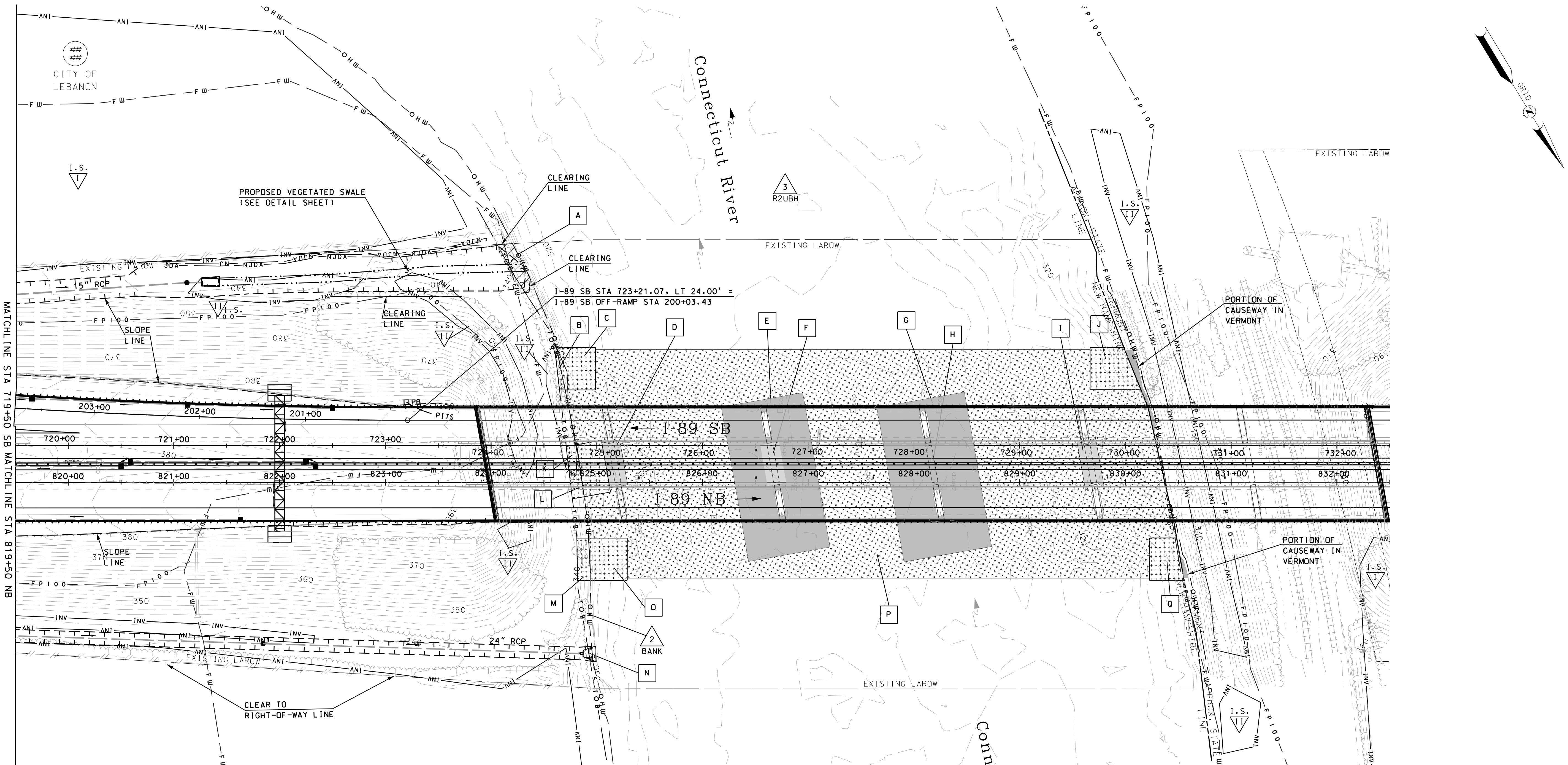
50 0 50 100
SCALE IN FEET

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

WETLAND PLAN 01

McFarland Johnson

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16148genplans	16148	5	14



LEGEND

TYPE OF WETLAND IMPACT	SHADING/ HATCHING
NEW HAMPSHIRE WETLANDS BUREAU (PERMANENT NON-WETLAND)	
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)	
TEMPORARY IMPACTS	
TEMPORARY IMPACTS IN VERMONT	

\# WETLAND DESIGNATION NUMBER

\# WETLAND IMPACT LOCATION

\# WETLAND MITIGATION AREA

MITIGATION

50 0 50 100
SCALE IN FEET

McFarland Johnson

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

WETLAND PLAN 02

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16148genplans	16148	6	14

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	STATION	DESCRIPTION

SDR PROCESSED NHDOT DATE 04-2015
NEW DESIGN MJ DATE 04-2016
SHEET CHECKED BRC DATE 02-2018
AS BUILT DETAILS DATE

EROSION CONTROL STRATEGIES

1. ENVIRONMENTAL COMMITMENTS:
   1.1. THESE GUIDELINES DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH ANY CONTRACT PROVISIONS, OR APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
   1.2. THIS PROJECT WILL BE SUBJECT TO THE US EPA'S NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORM WATER CONSTRUCTION GENERAL PERMIT AS ADMINISTERED BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THIS PROJECT IS SUBJECT TO REQUIREMENTS IN THE MOST RECENT CONSTRUCTION GENERAL PERMIT (CGP).
   1.3. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE NHDES WETLAND PERMIT, THE US ARMY CORPS OF ENGINEERS PERMIT, WATER QUALITY CERTIFICATION AND THE SPECIAL ATTENTION ITEMS INCLUDED IN THE CONTRACT DOCUMENTS.
   1.4. ALL STORM WATER, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION (DECEMBER 2008) (BMP MANUAL) AVAILABLE FROM THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES (NHDES).
   1.5. THE CONTRACTOR SHALL COMPLY WITH RSA 485-A:17, AND ALL, PUBLISHED NHDES ALTERATION OF TERRAIN ENV-WQ 1500 REQUIREMENTS (HTTP://DES.NH.GOV/ORGANIZATION/COMMISSIONER/LEGAL/RULES/INDEX.HTM)
   1.6. THE CONTRACTOR IS DIRECTED TO REVIEW AND COMPLY WITH SECTION 107.1 OF THE CONTRACT AS IT REFERS TO SPILLAGE, AND ALSO WITH REGARDS TO EROSION, POLLUTION, AND TURBIDITY PRECAUTIONS.

2. STANDARD EROSION CONTROL SEQUENCING APPLICABLE TO ALL CONSTRUCTION PROJECTS:
   2.1. PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH DISTURBING ACTIVITIES. PERIMETER CONTROLS AND STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AS SHOWN IN THE BMP MANUAL AND AS DIRECTED BY THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PREPARER.
   2.2. EROSION, SEDIMENTATION CONTROL MEASURES AND INFILTRATION BASINS SHALL BE CLEANED, REPLACED AND AUGMENTED AS NECESSARY TO PREVENT SEDIMENTATION BEYOND PROJECT LIMITS THROUGHOUT THE PROJECT DURATION.
   2.3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED IN ACCORDANCE WITH THE CONSTRUCTION GENERAL PERMIT AND SECTION 645 OF THE NHDOT SPECIFICATIONS FOR ROAD AND BRIDGES CONSTRUCTION.
   2.4. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
      (A) BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
      (B) A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
      (C) A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP-RAP HAS BEEN INSTALLED;
      (D) TEMPORARY SLOPE STABILIZATION CONFORMING TO TABLE 1 HAS BEEN PROPERLY INSTALLED
   2.5. ALL STOCKPILES SHALL BE CONTAINED WITH A PERIMETER CONTROL. IF THE STOCKPILE IS TO REMAIN UNDISTURBED FOR MORE THAN 14 DAYS, MULCHING WILL BE REQUIRED.
   2.6. A WATER TRUCK SHALL BE AVAILABLE TO CONTROL EXCESSIVE DUST AT THE DIRECTION OF THE CONTRACT ADMINISTRATOR.
   2.7. TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL REMAIN UNTIL THE AREA HAS BEEN PERMANENTLY STABILIZED.
   2.8. CONSTRUCTION PERFORMED ANY TIME BETWEEN NOVEMBER 30" AND MAY 1" OF ANY YEAR SHALL BE CONSIDERED WINTER CONSTRUCTION AND SHALL CONFORM TO THE FOLLOWING REQUIREMENTS.
      (A) ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15", OR WHICH ARE DISTURBED AFTER OCTOBER 15", SHALL BE STABILIZED IN ACCORDANCE WITH TABLE 1.
      (B) ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15", OR WHICH ARE DISTURBED AFTER OCTOBER 15", SHALL BE STABILIZED TEMPORARILY WITH STONE OR IN ACCORDANCE WITH TABLE 1.
      (C) AFTER NOVEMBER 30" INCOMPLETE ROAD SURFACES, WHERE WORK HAS STOPPED FOR THE SEASON, SHALL BE PROTECTED IN ACCORDANCE WITH TABLE 1.
      (D) WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE PROJECT IS WITHOUT STABILIZATION AT ONE TIME, UNLESS A WINTER STABILIZATION PLAN HAS BEEN APPROVED BY NHDOT.
      (E) A SWPPP AMENDMENT SHALL BE SUBMITTED TO THE DEPARTMENT, FOR APPROVAL, ADDRESSING COLD WEATHER STABILIZATION (ENV-WQ 1505.05) NO LESS THAN 30 DAYS PRIOR TO THE COMMENCEMENT OF WORK SCHEDULED AFTER NOVEMBER 30".

GENERAL CONSTRUCTION PLANNING AND SELECTION OF STRATEGIES TO CONTROL EROSION AND SEDIMENT ON HIGHWAY CONSTRUCTION PROJECTS

3. PLAN ACTIVITIES TO ACCOUNT FOR SENSITIVE SITE CONDITIONS:
   3.1. CLEARLY FLAG AREAS TO BE PROTECTED IN THE FIELD AND PROVIDE CONSTRUCTION BARRIERS TO PREVENT TRAFFICKING OUTSIDE OF WORK AREAS.
   3.2. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS.
   3.3. PROTECT AND MAXIMIZE EXISTING NATIVE VEGETATION AND NATURAL FOREST BUFFERS BETWEEN CONSTRUCTION ACTIVITY AND SENSITIVE AREAS.
   3.4. WHEN WORK IS PERFORMED IN AND NEAR WATER COURSES, STREAM FLOW DIVERSION METHODS SHALL BE IMPLEMENTED PRIOR TO ANY EXCAVATION OR FILLING.
   3.5. WHEN WORK IS PERFORMED WITHIN 50 FEET OF SURFACE WATERS (WETLAND, OPEN WATER OR FLOWING WATER), PERIMETER CONTROL SHALL BE ENHANCED CONSISTENT WITH SECTION 2.1.2.1. OF THE 2012 NPDES CONSTRUCTION GENERAL PERMIT.

4. MINIMIZE THE AMOUNT OF EXPOSED SOIL:
   4.1. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS. MINIMIZE THE AREA OF EXPOSED SOIL AT ANY ONE TIME. PHASING SHALL BE USED TO REDUCE THE AMOUNT AND DURATION OF SOIL EXPOSED TO THE ELEMENTS AND VEHICLE TRACKING.
   4.2. UTILIZE TEMPORARY MULCHING OR PROVIDE ALTERNATE TEMPORARY STABILIZATION ON EXPOSED SOILS IN ACCORDANCE WITH TABLE 1.
   4.3. THE MAXIMUM AMOUNT OF DISTURBED EARTH SHALL NOT EXCEED A TOTAL OF 5 ACRES FROM MAY 1" THROUGH NOVEMBER 30", OR EXCEED ONE ACRE DURING WINTER MONTHS, UNLESS THE CONTRACTOR DEMONSTRATES TO THE DEPARTMENT THAT THE ADDITIONAL AREA OF DISTURBANCE IS NECESSARY TO MEET THE CONTRACTORS CRITICAL PATH METHOD SCHEDULE (CPM), AND THE CONTRACTOR HAS ADEQUATE RESOURCES AVAILABLE TO ENSURE THAT ENVIRONMENTAL COMMITMENTS WILL BE MET.

5. CONTROL STORMWATER FLOWING ONTO AND THROUGH THE PROJECT:
   5.1. DIVERT OFF SITE RUNOFF OR CLEAN WATER AWAY FROM THE CONSTRUCTION ACTIVITY TO REDUCE THE VOLUME THAT NEEDS TO BE TREATED ON SITE.
   5.2. DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM DISTURBED AREAS, SLOPES, AND AROUND ACTIVE WORK AREAS AND TO A STABILIZED OUTLET LOCATION.
   5.3. CONSTRUCT IMPERMEABLE BARRIERS AS NECESSARY TO COLLECT OR DIVERT CONCENTRATED FLOWS FROM WORK OR DISTURBED AREAS.
   5.4. STABILIZE, TO APPROPRIATE ANTICIPATED VELOCITIES, CONVEYANCE CHANNELS OR PUMPING SYSTEMS NEEDED TO CONVEY CONSTRUCTION STORMWATER TO BASINS AND DISCHARGE LOCATIONS PRIOR TO USE.
   5.5. DIVERT OFF-SITE WATER THROUGH THE PROJECT IN AN APPROPRIATE MANNER SO NOT TO DISTURB THE UPSTREAM OR DOWNSTREAM SOILS, VEGETATION OR HYDROLOGY BEYOND THE PERMITTED AREA.

6. PROTECT SLOPES:
   6.1. INTERCEPT AND DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM UNPROTECTED AND NEWLY ESTABLISHED AREAS AND SLOPES TO A STABILIZED OUTLET OR CONVEYANCE.
   6.2. CONSIDER HOW GROUNDWATER SEEPAGE ON CUT SLOPES MAY IMPACT SLOPE STABILITY AND INCORPORATE APPROPRIATE MEASURES TO MINIMIZE EROSION.
   6.3. CONVEY STORMWATER DOWN THE SLOPE IN A STABILIZED CHANNEL OR SLOPE DRAIN.
   6.4. THE OUTER FACE OF THE FILL SLOPE SHOULD BE IN A LOOSE RUFFLED CONDITION PRIOR TO TURF ESTABLISHMENT. TOPSOIL OR HUMUS LAYERS SHALL BE TRACKED UP AND DOWN THE SLOPE, DISKED, HARROWED, DRAGGED WITH A CHAIN OR MAT, MACHINE-RAKED, OR HAND-WORKED TO PRODUCE A RUFFLED SURFACE.

7. ESTABLISH STABILIZED CONSTRUCTION EXITS:
   7.1. INSTALL AND MAINTAIN CONSTRUCTION EXITS, ANYWHERE TRAFFIC LEAVES A CONSTRUCTION SITE ONTO A PUBLIC RIGHT-OF-WAY.
   7.2. SWEEP ALL CONSTRUCTION RELATED DEBRIS AND SOIL FROM THE ADJACENT PAVED ROADWAYS AS NECESSARY.

8. PROTECT STORM DRAIN INLETS:
   8.1. DIVERT SEDIMENT LADEN WATER AWAY FROM INLET STRUCTURES TO THE EXTENT POSSIBLE.
   8.2. INSTALL SEDIMENT BARRIERS AND SEDIMENT TRAPS AT INLETS TO PREVENT SEDIMENT FROM ENTERING THE DRAINAGE SYSTEM.
   8.3. CLEAN CATCH BASINS, DRAINAGE PIPES, AND CULVERTS IF SIGNIFICANT SEDIMENT IS DEPOSITED.
   8.4. DROP INLET SEDIMENT BARRIERS SHOULD NEVER BE USED AS THE PRIMARY MEANS OF SEDIMENT CONTROL AND SHOULD ONLY BE USED TO PROVIDE AN ADDITIONAL LEVEL OF PROTECTION TO STRUCTURES AND DOWN-GRADIENT SENSITIVE RECEPTORS.

9. SOIL STABILIZATION:
   9.1. WITHIN THREE DAYS OF THE LAST ACTIVITY IN AN AREA, ALL EXPOSED SOIL AREAS, WHERE CONSTRUCTION ACTIVITIES ARE COMPLETE, SHALL BE STABILIZED.
   9.2. IN ALL AREAS, TEMPORARY SOIL STABILIZATION MEASURES SHALL BE APPLIED IN ACCORDANCE WITH THE STABILIZATION REQUIREMENTS (SECTION 2.2) OF THE 2012 CGP. (SEE TABLE 1 FOR GUIDANCE ON THE SELECTION OF TEMPORARY SOIL STABILIZATION MEASURES.)
   9.3. EROSION CONTROL SEED MIX SHALL BE SOWN IN ALL INACTIVE CONSTRUCTION AREAS THAT WILL NOT BE PERMANENTLY SEEDED WITHIN TWO WEEKS OF DISTURBANCE AND PRIOR TO SEPTEMBER 15, OF ANY GIVEN YEAR, IN ORDER TO ACHIEVE VEGETATIVE STABILIZATION PRIOR TO THE END OF THE GROWING SEASON.
   9.4. SOIL TACKIFIERS MAY BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND REAPPLIED AS NECESSARY TO MINIMIZE SOIL AND MULCH LOSS UNTIL PERMANENT VEGETATION IS ESTABLISHED.

10. RETAIN SEDIMENT ON-SITE AND CONTROL DEWATERING PRACTICES:
   10.1. TEMPORARY SEDIMENT BASINS (CGP-SECTION 2.1.3.2) OR SEDIMENT TRAPS (ENV-WQ 1506.10) SHALL BE SIZED TO RETAIN, ON SITE, THE VOLUME OF A 2-YEAR 24-HOUR STORM EVENT FOR ANY AREA OF DISTURBANCE OR 3,600 CUBIC FEET OF STORMWATER RUNOFF PER ACRE OF DISTURBANCE, WHICHEVER IS GREATER. TEMPORARY SEDIMENT BASINS USED TO TREAT STORMWATER RUNOFF FROM AREAS GREATER THAN 5-ACRES OF DISTURBANCE SHALL BE SIZED TO ALSO CONTROL STORMWATER RUNOFF FROM A 10-YEAR 24 HOUR STORM EVENT. ON-SITE RETENTION OF THE 10-YEAR 24-HOUR EVENT IS NOT REQUIRED.
   10.2. CONSTRUCT AND STABILIZE DEWATERING INFILTRATION BASINS PRIOR TO ANY EXCAVATION THAT MAY REQUIRE DEWATERING.
   10.3. TEMPORARY SEDIMENT BASINS OR TRAPS SHALL BE PLACED AND STABILIZED AT LOCATIONS WHERE CONCENTRATED FLOW (CHANNELS AND PIPES) DISCHARGE TO THE SURROUNDING ENVIRONMENT FROM AREAS OF UNSTABILIZED EARTH DISTURBING ACTIVITIES.

11. ADDITIONAL EROSION AND SEDIMENT CONTROL GENERAL PRACTICES:
   11.1. USE TEMPORARY MULCHING, PERMANENT MULCHING, TEMPORARY VEGETATIVE COVER, AND PERMANENT VEGETATIVE COVER TO REDUCE THE NEED FOR DUST CONTROL. USE MECHANICAL SWEEPERS ON PAVED SURFACES WHERE NECESSARY TO PREVENT DUST BUILDUP. APPLY WATER, OR OTHER DUST INHIBITING AGENTS OR TACKIFIERS, AS APPROVED BY THE NHDES.
   11.2. ALL STOCKPILES SHALL BE CONTAINED WITH TEMPORARY PERIMETER CONTROLS. INACTIVE SOIL STOCKPILES SHOULD BE PROTECTED WITH SOIL STABILIZATION MEASURES (TEMPORARY EROSION CONTROL SEED MIX AND MULCH, SOIL BINDER) OR COVERED WITH ANCHORED TARPS.
   11.3. EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSPECTED IN ACCORDANCE WITH SECTION 645 OF NHDOT SPECIFICATIONS, WEEKLY AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.25 IN. OF RAIN PER 24-HOUR PERIOD. EROSION AND SEDIMENT CONTROL MEASURES WILL ALSO BE INSPECTED IN ACCORDANCE WITH THE GUIDANCE MEMO FROM THE NHDES CONTAINED WITHIN THE CONTRACT PROPOSAL AND THE EPA CONSTRUCTION GENERAL PERMIT.
   11.4. THE CONTRACTOR SHOULD UTILIZE STORM DRAIN INLET PROTECTION TO PREVENT SEDIMENT FROM ENTERING A STORM DRAINAGE SYSTEM PRIOR TO THE PERMANENT STABILIZATION OF THE CONTRIBUTING DISTURBED AREA.
   11.5. PERMANENT STABILIZATION MEASURES WILL BE CONSTRUCTED AND MAINTAINED IN LOCATIONS AS SHOWN ON THE CONSTRUCTION PLANS TO STABILIZE AREAS. VEGETATIVE STABILIZATION SHALL NOT BE CONSIDERED PERMANENTLY STABILIZED UNTIL VEGETATIVE GROWTH COVERS AT LEAST 85% OF THE DISTURBED AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL FOR ONE YEAR AFTER PROJECT COMPLETION.
   11.6. CATCH BASINS: CARE SHALL BE TAKEN TO ENSURE THAT SEDIMENTS DO NOT ENTER ANY EXISTING CATCH BASINS DURING CONSTRUCTION. THE CONTRACTOR SHALL PLACE TEMPORARY STONE INLET PROTECTION OVER INLETS IN AREAS OF SOIL DISTURBANCE THAT ARE SUBJECT TO SEDIMENT CONTAMINATION.
   11.7. TEMPORARY AND PERMANENT DITCHES SHALL BE CONSTRUCTED, STABILIZED AND MAINTAINED IN A MANNER THAT WILL MINIMIZE SCOUR. TEMPORARY AND PERMANENT DITCHES SHALL BE DIRECTED TO DRAIN TO SEDIMENT BASINS OR STORM WATER COLLECTION AREAS.
   11.8. WINTER EXCAVATION AND EARTHWORK ACTIVITIES NEED TO BE LIMITED IN EXTENT AND DURATION, TO MINIMIZE POTENTIAL EROSION AND SEDIMENTATION IMPACTS. THE AREA OF EXPOSED SOIL SHALL BE LIMITED TO ONE ACRE, OR THAT WHICH CAN BE STABILIZED AT THE END OF EACH DAY UNLESS A WINTER CONSTRUCTION PLAN, DEVELOPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST, IS REVIEWED AND APPROVED BY THE DEPARTMENT.
   11.9. CHANNEL PROTECTION MEASURES SHALL BE SUPPLEMENTED WITH PERIMETER CONTROL MEASURES WHEN THE DITCH LINES OCCUR AT THE BOTTOM OF LONG FILL SLOPES. THE PERIMETER CONTROLS SHALL BE INSTALLED ON THE FILL SLOPE TO MINIMIZE THE POTENTIAL FOR FILL SLOPE SEDIMENT DEPOSITS IN THE DITCH LINE.

BEST MANAGEMENT PRACTICES (BMP) BASED ON AMOUNT OF OPEN CONSTRUCTION AREA

12. STRATEGIES SPECIFIC TO OPEN AREAS LESS THAN 5 ACRES:
   12.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500; ALTERATION OF TERRAIN FOR CONSTRUCTION AND USE ALL CONVENTIONAL BMP STRATEGIES.
   12.2. SLOPES STEEPER THAN 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING.
   12.3. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT ALONE.
   12.4. AREAS WHERE HAUL ROADS ARE CONSTRUCTED AND STORMWATER CANNOT BE TREATED THE DEPARTMENT WILL CONSIDER INFILTRATION.
   12.5. FOR HAUL ROADS ADJACENT TO SENSITIVE ENVIRONMENTAL AREAS OR STEEPER THAN 5%, THE DEPARTMENT WILL CONSIDER USING EROSION STONE, CRUSHED GRAVEL, OR CRUSHED STONE BASE TO HELP MINIMIZE EROSION ISSUES.
   12.6. ALL AREAS THAT CAN BE STABILIZED SHALL BE STABILIZED PRIOR TO OPENING UP NEW TERRITORY.
   12.7. DETENTION BASINS SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE A 2 YEAR STORM EVENT.

13. STRATEGIES SPECIFIC TO OPEN AREAS BETWEEN 5 AND 10 ACRES:
   13.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES WILL BE UTILIZED.
   13.2. DETENTION BASINS WILL BE CONSTRUCTED TO ACCOMMODATE THE 2-YEAR 24-HOUR STORM EVENT AND CONTROL A 10-YEAR 24-HOUR STORM EVENT.
   13.3. SLOPES STEEPER THAN A 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS. OTHER ALTERNATIVE MEASURES, SUCH AS BONDED FIBER MATRIXES (BFMS) OR FLEXIBLE GROWTH MEDIUMS (FGMS) MAY BE UTILIZED, IF MEETING THE NHDES APPROVALS AND REGULATIONS.
   13.4. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS.

14. STRATEGIES SPECIFIC TO OPEN AREAS OVER 10 ACRES:
   14.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES AND BETWEEN 5 AND 10 ACRES WILL BE UTILIZED.
   14.2. THE DEPARTMENT ANTICIPATES THAT SOIL BINDERS WILL BE NEEDED ON ALL SLOPES STEEPER THAN 3:1, IN ORDER TO MINIMIZE EROSION AND REDUCE THE AMOUNT OF SEDIMENT IN THE STORMWATER TREATMENT BASINS.
   14.3. THE CONTRACTOR WILL BE REQUIRED TO HAVE AN APPROVED DESIGN IN ACCORDANCE WITH ENV-WQ 1506.12 FOR AN ACTIVE FLOCCULANT TREATMENT SYSTEM TO TREAT AND RELEASE WATER CAPTURED IN STORM WATER BASINS. THE CONTRACTOR SHALL ALSO RETAIN THE SERVICES OF AN ENVIRONMENTAL CONSULTANT WHO HAS DEMONSTRATED EXPERIENCE IN THE DESIGN OF FLOCCULANT TREATMENT SYSTEMS. THE CONSULTANT WILL ALSO BE RESPONSIBLE FOR THE IMPLEMENTATION AND MONITORING OF THE SYSTEM.

TABLE 1
GUIDANCE ON SELECTING TEMPORARY SOIL STABILIZATION MEASURES

APPLICATION AREAS	DRY MULCH METHODS				HYDRAULICALLY APPLIED MULCHES[2]				ROLLED EROSION CONTROL BLANKETS[3]			
	HMT	WC	SG	CB	HM	SMM	BFM	FRM	SNSB	DNSB	DNSCB	DNCB
SLOPES[1]												
STEEPER THAN 2:1	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	YES
2:1 SLOPE	YES'	YES'	YES	YES	NO	NO	YES	YES	NO	YES	YES	YES
3:1 SLOPE	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO
4:1 SLOPE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO
WINTER STABILIZATION	4T/AC	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES
CHANNELS												
LOW FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
HIGH FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES

ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE
HMT	HAY MULCH & TACK	HM	HYDRAULIC MULCH	SNSB	SINGLE NET STRAW BLANKET
WC	WOOD CHIPS	SMM	STABILIZED MULCH MATRIX	DNSB	DOUBLE NET STRAW BLANKET
SG	STUMP GRINDINGS	BFM	BONDED FIBER MATRIX	DNSCB	2 NET STRAW-COCONUT BLANKET
CB	COMPOST BLANKET	FRM	FIBER REINFORCED MEDIUM	DNCB	2 NET COCONUT BLANKET

NOTES:
1. ALL SLOPE STABILIZATION OPTIONS ASSUME A SLOPE LENGTH ≤10 TIMES THE HORIZONTAL DISTANCE COMPONENT OF THE SLOPE, IN FEET.
2. PRODUCTS CONTAINING POLYACRYLAMIDE (PAM) SHALL NOT BE APPLIED DIRECTLY TO OR WITHIN 100 FEET OF ANY SURFACE WATER WITHOUT PRIOR WRITTEN APPROVAL FROM THE NH DEPARTMENT OF ENVIRONMENTAL SERVICES.
3. ALL EROSION CONTROL BLANKETS SHALL BE MADE WITH WILDLIFE FRIENDLY BIODEGRADABLE NETTING.

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

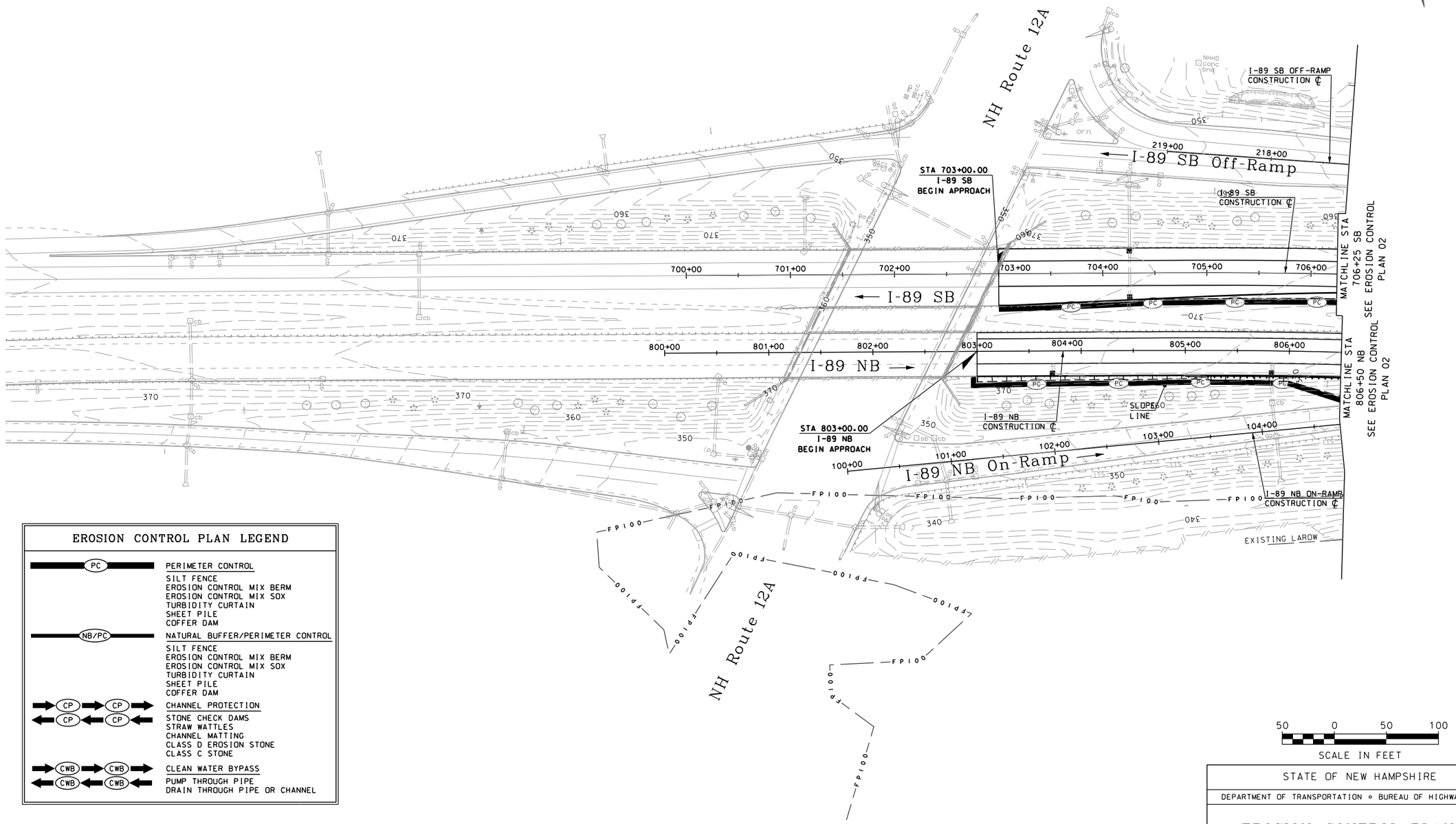
EROSION CONTROL STRATEGIES

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
12-21-2015	16148erostr.dgn	16148	7	14

REVISIONS AFTER PROPOSAL

NUMBER	DATE	DESCRIPTION	STATION

SDR PROCESSED	NHDOT	DATE	04-2015
NEW DESIGN	MJ	DATE	04-2016
SHEET CHECKED	BRC	DATE	02-2018
AS BUILT DETAILS		DATE	



EROSION CONTROL PLAN LEGEND

PERIMETER CONTROL (PC)
- SILT FENCE
- EROSION CONTROL MIX BERM
- EROSION CONTROL MIX SOX
- TURBIDITY CURTAIN
- SHEET PILE
- COFFER DAM

NATURAL BUFFER/PERIMETER CONTROL (NB/PC)
- SILT FENCE
- EROSION CONTROL MIX BERM
- EROSION CONTROL MIX SOX
- TURBIDITY CURTAIN
- SHEET PILE
- COFFER DAM

CHANNEL PROTECTION (CP)
- STONE CHECK DAMS
- STRAW WATTLES
- CHANNEL MATTING
- CLASS D EROSION STONE
- CLASS C STONE

CLEAN WATER BYPASS (CWB)
- PUMP THROUGH PIPE
- DRAIN THROUGH PIPE OR CHANNEL

50 0 50 100

SCALE IN FEET

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLAN 01

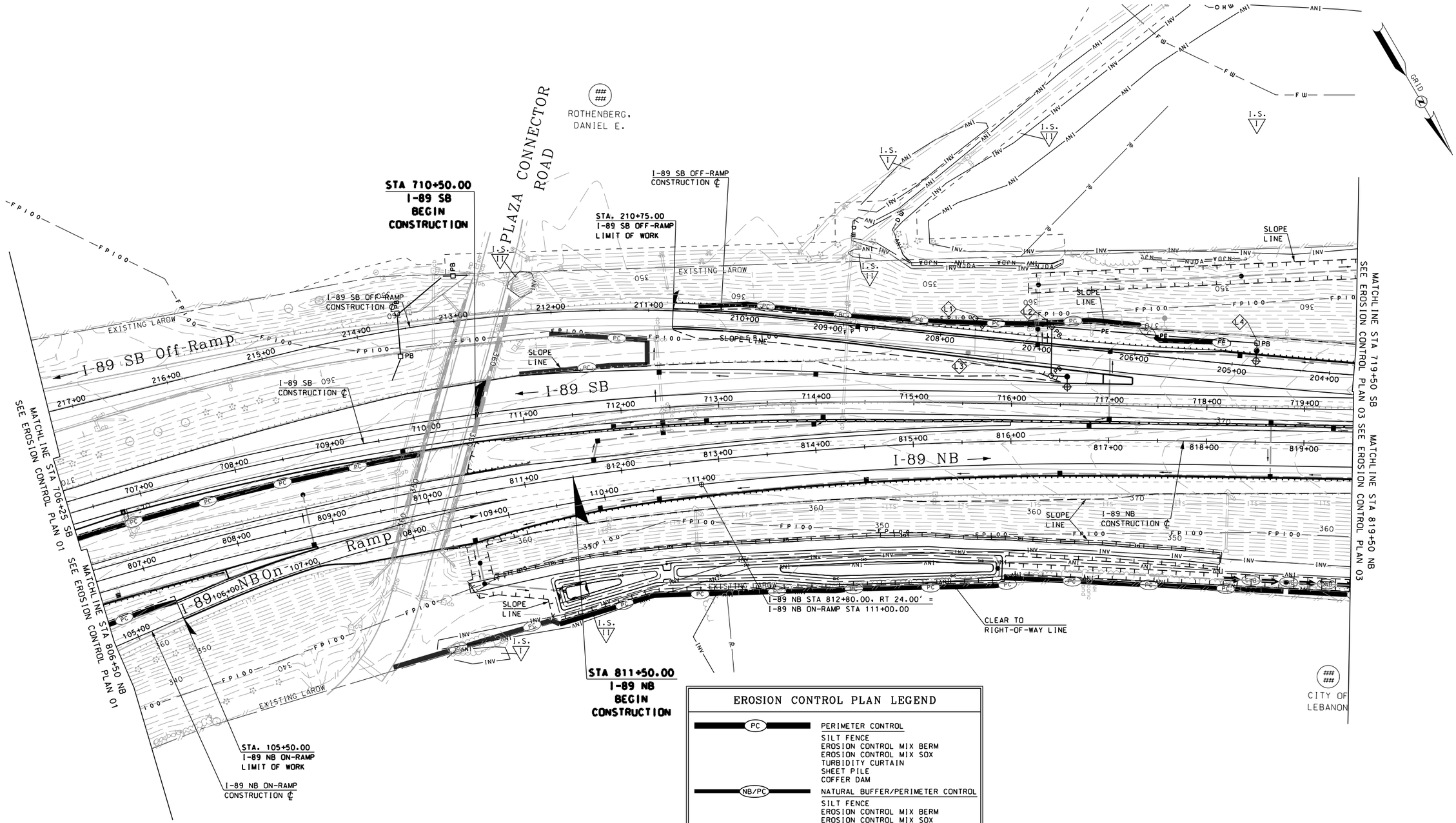
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16148eroplans	16148	8	14

McFarland Johnson

REVISIONS AFTER PROPOSAL

NUMBER	DATE	DESCRIPTION	STATION

SDR PROCESSED	NHDOT	DATE 04-2015
NEW DESIGN	WJ	DATE 04-2016
SHEET CHECKED	BRC	DATE 02-2018
AS BUILT DETAILS		DATE



NOTES:

1. AREAS BEYOND THE R.O.W. HAVE BEEN REVIEWED FOR JURISDICTIONAL WETLANDS. NO WETLANDS ARE LOCATED WITHIN 50' OF THE EXISTING RIGHT-OF-WAY.

2. PLACE PERIMETER CONTROL AT RIGHT-OF-WAY LINE.

EROSION CONTROL PLAN LEGEND

PC	PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
NB/PC	NATURAL BUFFER/PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
CP	CHANNEL PROTECTION
CP	STONE CHECK DAMS STRAW WATTLES CHANNEL MATTING CLASS D EROSION STONE CLASS C STONE
CWB	CLEAN WATER BYPASS
CWB	PUMP THROUGH PIPE DRAIN THROUGH PIPE OR CHANNEL

50 0 50 100

SCALE IN FEET

McFarland Johnson

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLAN 02

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16148eroplans	16148	9	14

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	DESCRIPTION

MATCHLINE STA 719+50 SB MATCHLINE STA 819+50 NB
SEE EROSION CONTROL PLAN 02

SEE EROSION CONTROL PLAN 02

CITY OF LEBANON

Connecticut River

PROPOSED VEGETATED SWALE (SEE DETAIL SHEET)

CLEARING LINE

EXISTING LAROW

I-89 SB STA 723+21.07, LT 24.00' = I-89 SB OFF-RAMP STA 200+03.43

INTERSTATE 89 SB CONSTRUCTION ℄

I-89 SB

I-89 NB

INTERSTATE 89 NB CONSTRUCTION ℄

SLOPE LINE

CLEAR TO RIGHT-OF-WAY LINE

TEMPORARY STATE LINE

NEW HAMPSHIRE

APPROX. STATE LINE

GRID N

SCALE IN FEET 50 0 50 100

NOTE:
VERMONT SIDE WILL REQUIRE VERMONT STORMWATER PERMITS AND EROSION CONTROL PLANS, PREPARED TO VERMONT STANDARDS.

EROSION CONTROL PLAN LEGEND

PC — PERIMETER CONTROL
- SILT FENCE
- EROSION CONTROL MIX BERM
- EROSION CONTROL MIX SOX
- TURBIDITY CURTAIN
- SHEET PILE
- COFFER DAM

NB/PC — NATURAL BUFFER/PERIMETER CONTROL
- SILT FENCE
- EROSION CONTROL MIX BERM
- EROSION CONTROL MIX SOX
- TURBIDITY CURTAIN
- SHEET PILE
- COFFER DAM

CP — CHANNEL PROTECTION
- STONE CHECK DAMS
- STRAW WATTLES
- CHANNEL MATTING
- CLASS D EROSION STONE
- CLASS C STONE

CWB — CLEAN WATER BYPASS
- PUMP THROUGH PIPE
- DRAIN THROUGH PIPE OR CHANNEL

I.S. 1

NOTES:

1. AREAS BEYOND THE R.O.W. HAVE BEEN REVIEWED FOR JURISDICTIONAL WETLANDS. NO WETLANDS ARE LOCATED WITHIN 50' OF THE EXISTING RIGHT-OF-WAY.
2. PLACE PERIMETER CONTROL AT RIGHT-OF-WAY LINE.

		DATE
SDR PROCESSED	NHDOT	04-2015
NEW DESIGN	MJ	04-2016
SHEET CHECKED	BRC	02-2018
AS BUILT DETAILS		DATE

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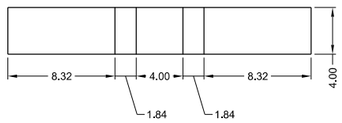
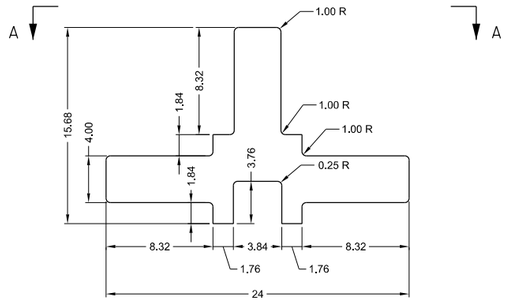
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLAN 03

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16148eroplans	16148	10	14



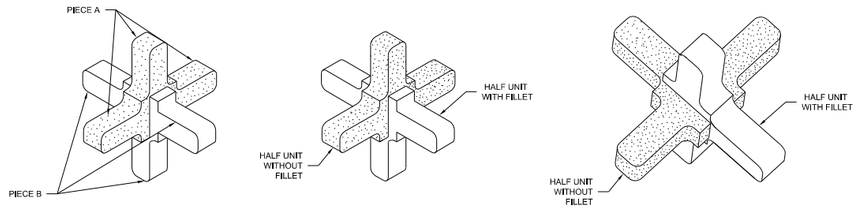
VIEW A-A
N.T.S.



ALL DIMENSIONS IN INCHES.

ELEVATION
N.T.S.

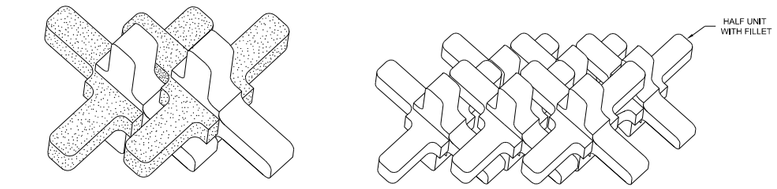
A-JACKS HALF UNIT (24-INCH)



1. IDENTIFY A-JACKS COMPONENTS

2. IDENTIFY CORNERS WITH AND WITHOUT FILLETS

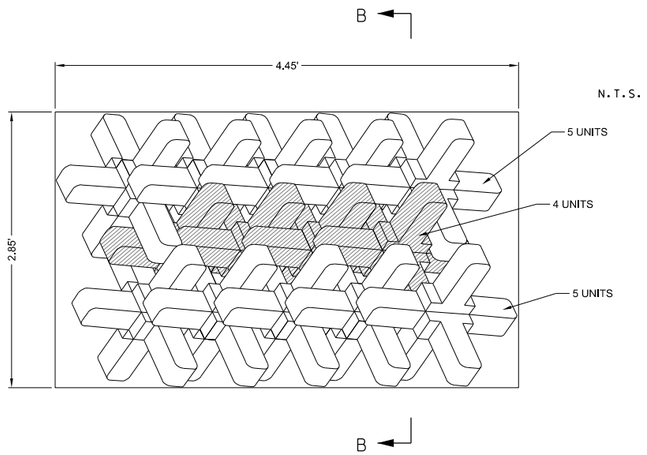
3. PROPER ROTATION OF A-JACKS



3. ALIGN ALL A-JACKS IN SAME DIRECTION CORNERS WITHOUT FILLET MUST LINE UP.

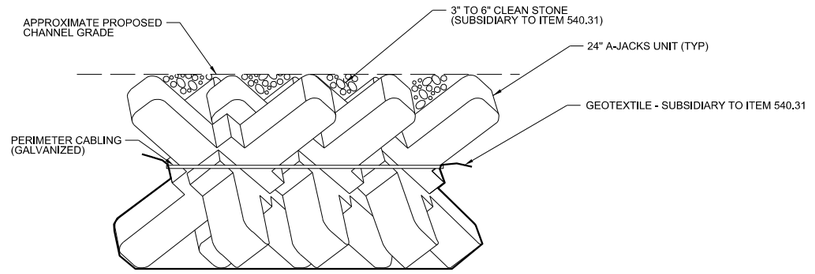
4. INSTALL 3ND ROW OF A-JACKS USING SAME ALIGNMENT

A-JACKS LAYOUT DETAIL
N.T.S.



N.T.S.

24" A-JACKS BUNDLE
(14 UNITS = 1,064 LBS)
N.T.S.
(SEE NOTE 1)



SECTION B-B
N.T.S.

NOTES

1. THE 5-4-5 BUNDLE IS A REPRESENTATIVE MINIMUM. ACTUAL BUNDLE SIZE TO BE DETERMINED BY THE CONTRACTOR BASED ON THE CONTRACTOR'S LIFTING EQUIPMENT CAPACITY.
2. PLACE BUNDLES WITH LONG AXIS PARALLEL TO THE FLOW OF THE RIVER.
3. EXISTING STREAMBEAD IS BASED ON CONTOURS FROM 2015 SURVEY. THE CONTRACTOR SHALL DETERMINE STREAMBED ELEVATIONS AND PREPARE A CHANNEL BOTTOM CONTOUR MAP PRIOR TO COMMENCEMENT OF WORK.
4. REFER TO SECTION 540 SPECIAL PROVISION FOR ADDITIONAL INFORMATION.

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

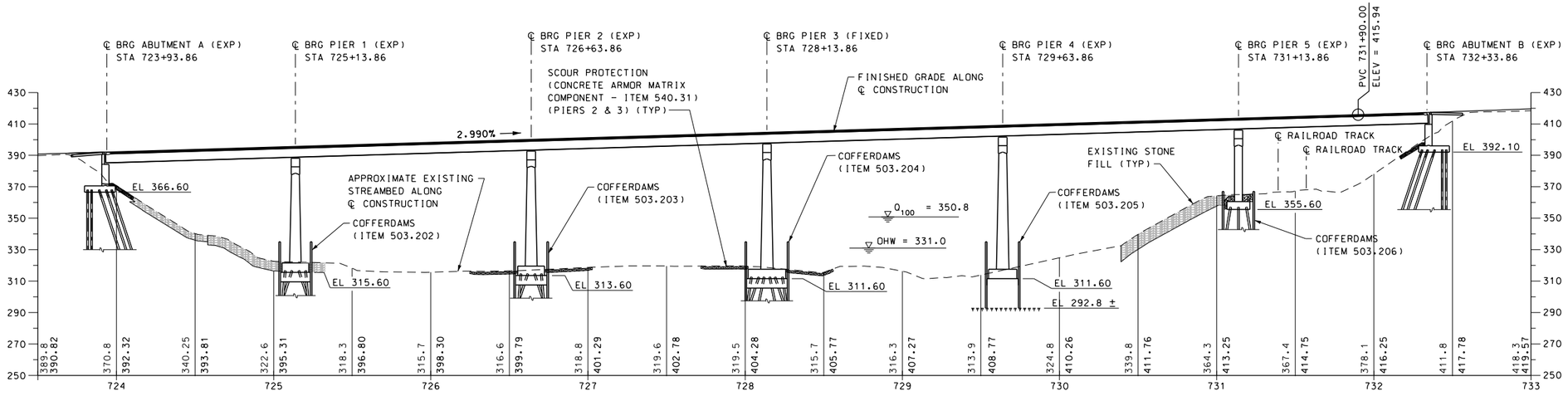
SDR PROCESSED	NHDOT	DATE 04-2015
NEW DESIGN	MJ	DATE 04-2016
SHEET CHECKED	BRC	DATE 02-2018
AS BUILT DETAILS		DATE

McFarland Johnson

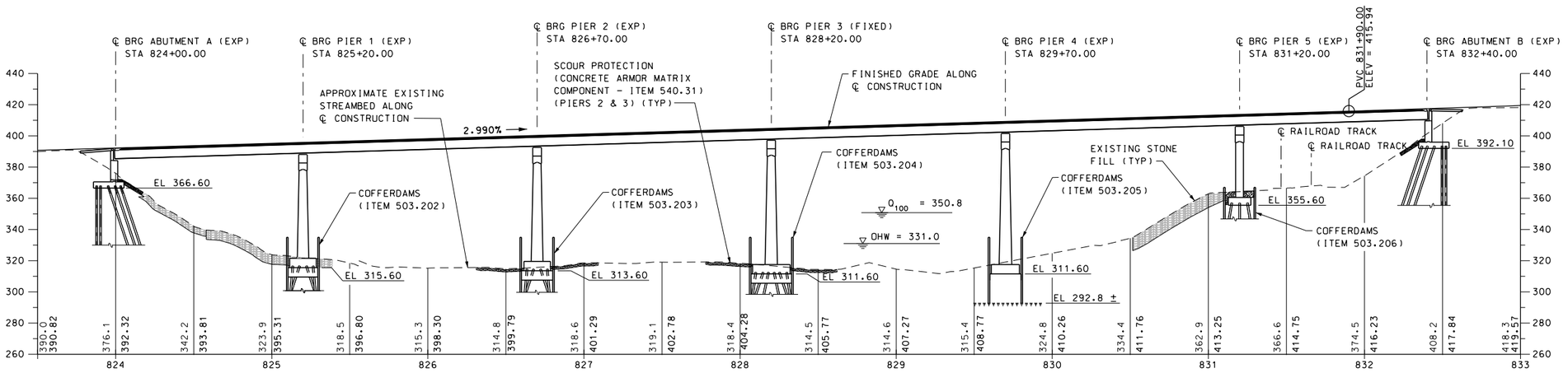
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

PRECAST CONCRETE REVETMENT DETAILS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16148pcnrvdt.dgn	16148	11	14



PROFILE - INTERSTATE 89 SOUTHBOUND
SCALE : 1" = 40'



PROFILE - INTERSTATE 89 NORTHBOUND
SCALE : 1" = 40'

NUMBER	DESCRIPTION	DATE	STATION
	REVISIONS AFTER PROPOSAL		

		DATE
SDR PROCESSED	NHDOT	04-2015
NEW DESIGN	MJ	04-2016
SHEET CHECKED	BRC	02-2018
AS BUILT DETAILS		DATE

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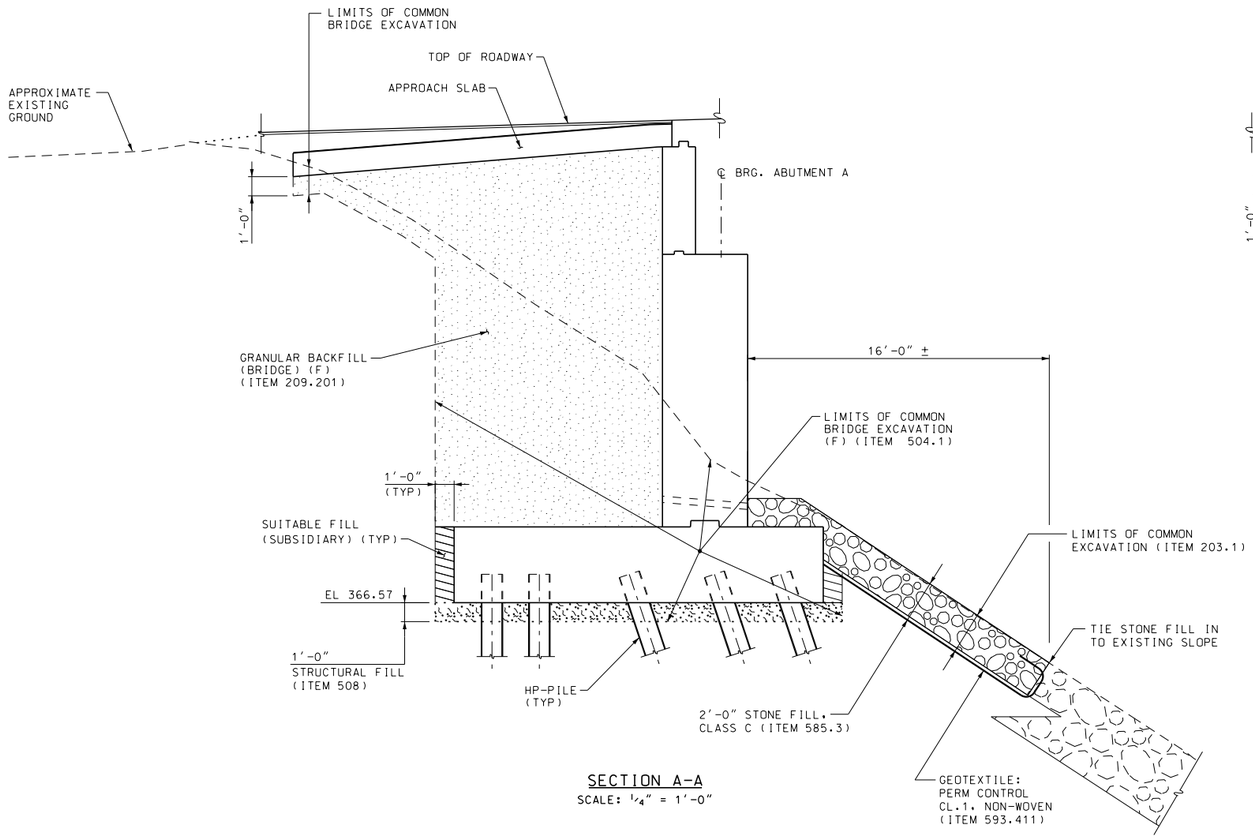
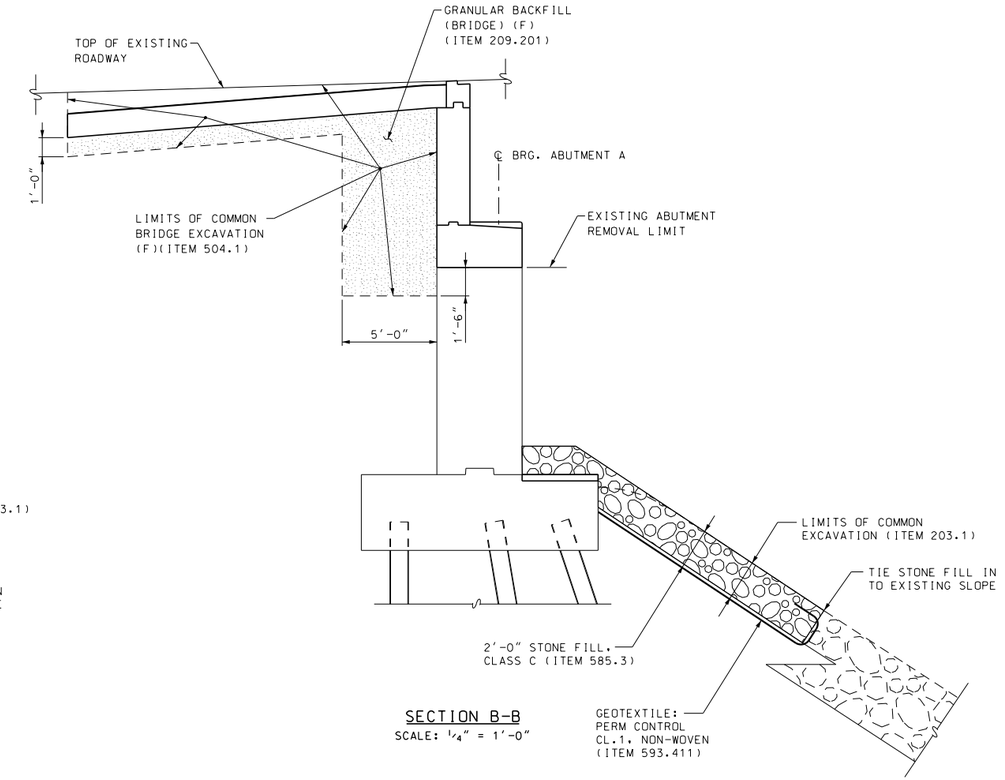
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

BRIDGE PROFILES

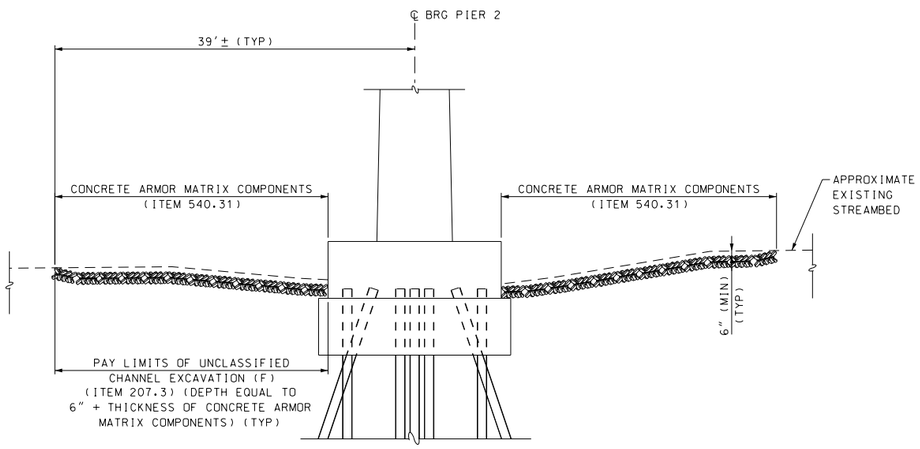
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16148brgpro.dgn	16148	12	14



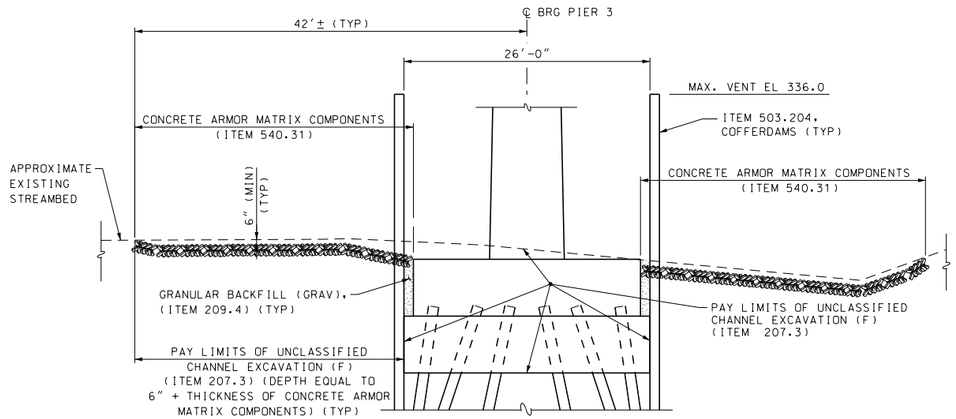
SECTION A-A
SCALE: 1/4" = 1'-0"



SECTION B-B
SCALE: 1/4" = 1'-0"



SECTION C-C
SCALE: 1/8" = 1'-0"



SECTION D-D
SCALE: 1/8" = 1'-0"

LEGEND:

GRANULAR BACKFILL (BRIDGE) (F) (ITEM 209.201)

NOTE:

1. FOR LOCATION OF SECTIONS, SEE BRIDGE SHEET 7.

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

		DATE
SDR PROCESSED	NHDOT	04-2015
NEW DESIGN	MJ	04-2016
SHEET CHECKED	BRC	02-2018
AS BUILT DETAILS		DATE

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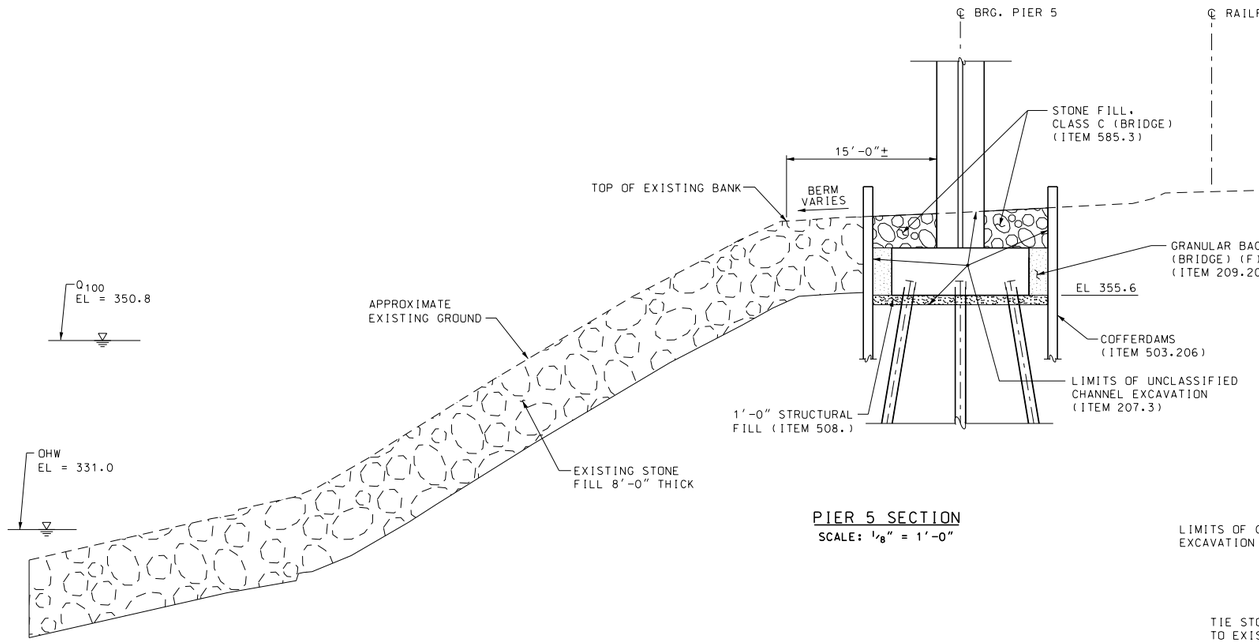
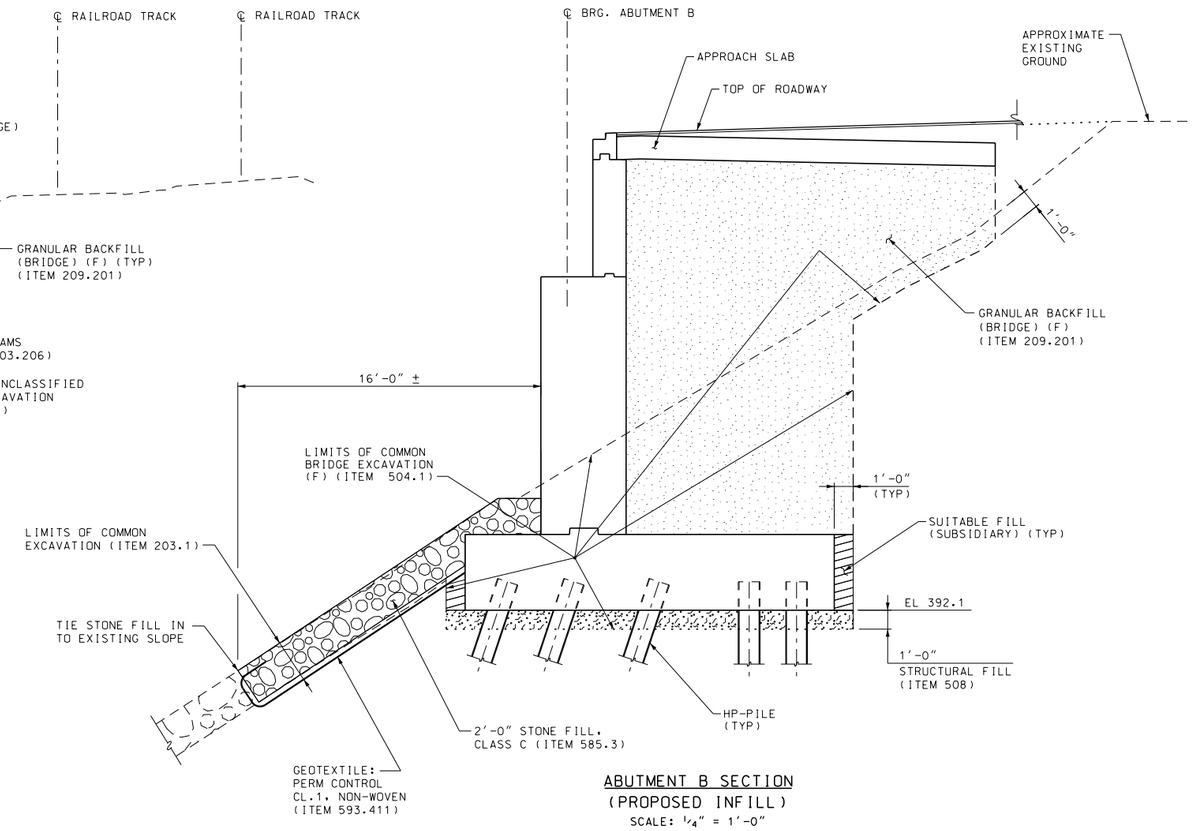
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

EARTHWORK SECTIONS (1 OF 2)

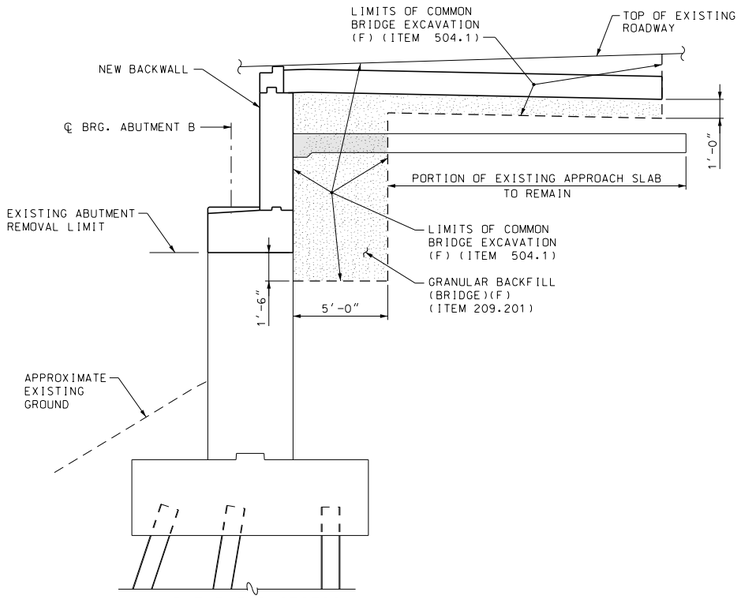
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16148chnsec.dgn	16148	13	14



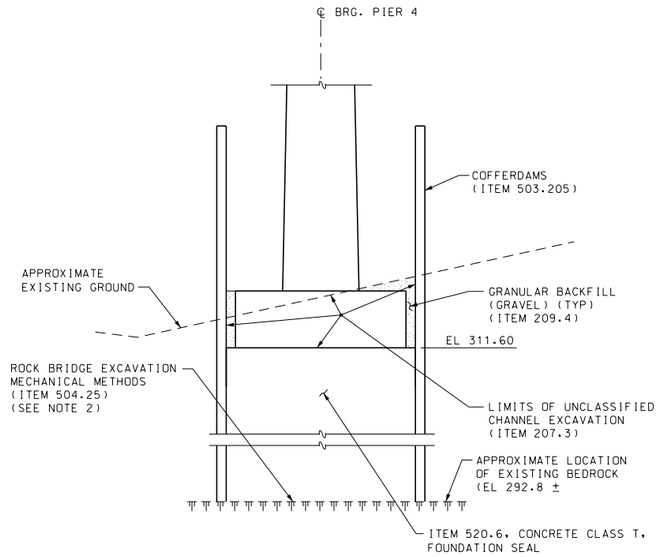
PIER 5 SECTION
SCALE: 1/8" = 1'-0"



ABUTMENT B SECTION
(PROPOSED INFILL)
SCALE: 1/4" = 1'-0"



ABUTMENT B SECTION
(EXISTING ABUTMENT)
SCALE: 1/4" = 1'-0"



PIER 4 SECTION
SCALE: 1/8" = 1'-0"

LEGEND:

GRANULAR BACKFILL (BRIDGE) (F) (ITEM 209.201)

PORTION OF EXISTING APPROACH SLAB TO BE REMOVED (ITEM 502. - REMOVAL OF EXISTING BRIDGE STRUCTURE)

NOTE:

1. LOCATION OF BEDROCK IS APPROXIMATE. BEDROCK SHALL BE REMOVED AS NECESSARY TO FACILITATE TREMIE SEAL PLACEMENT. REMOVAL SHALL BE PAID AS ROCK BRIDGE EXCAVATION MECHANICAL METHODS (ITEM 504.25)

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED	NHDOT	DATE 04-2015
NEW DESIGN	MJ	DATE 04-2016
SHEET CHECKED	BRC	DATE 02-2018
AS BUILT DETAILS		DATE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

EARTHWORK SECTIONS (2 OF 2)

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16148chnsec.dgn	16148	14	14

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Proposed footprint of A-Jacks scour protection

Proposed monitoring locations

0 310 620

Feet

NH Department of Transportation

Lebanon-Hartford 16148

Water Quality Sampling Plan

SCALE :	DATE :	FIGURE :
AS SHOWN	MAY 2019	1

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